THREE INDUSTRIAL NATIONS

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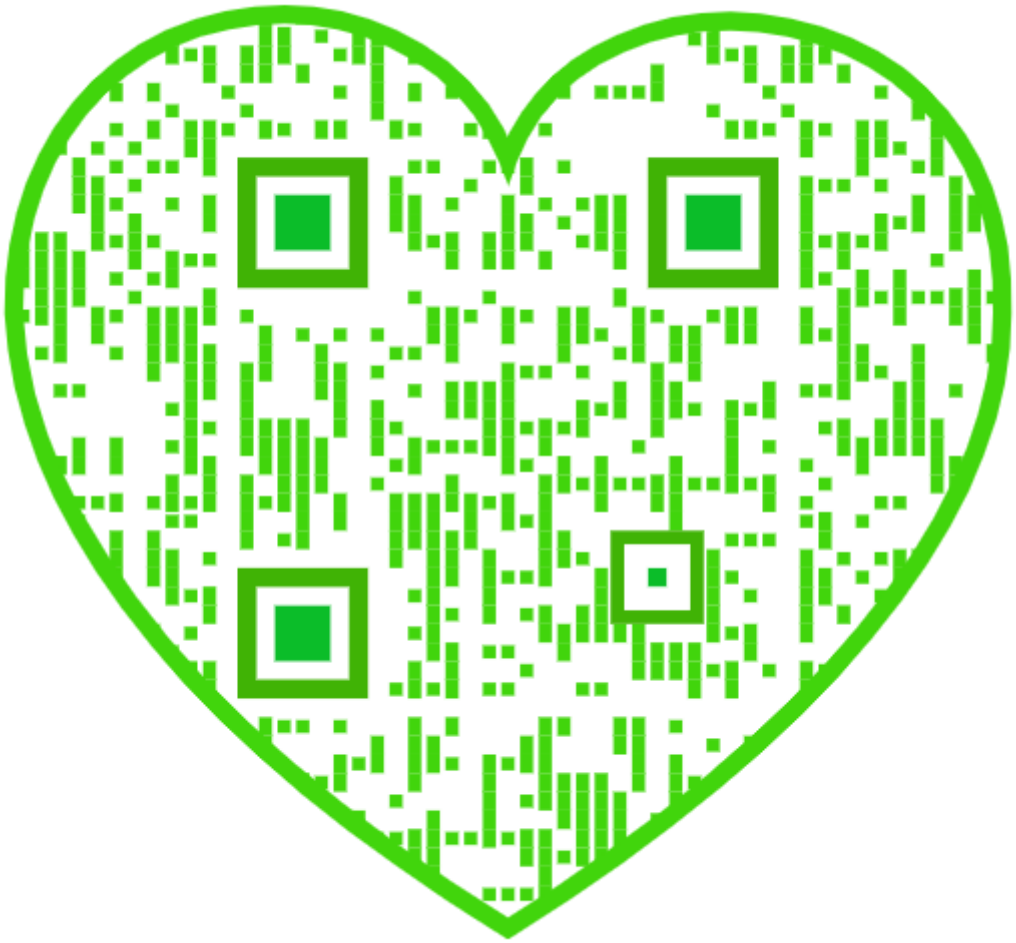
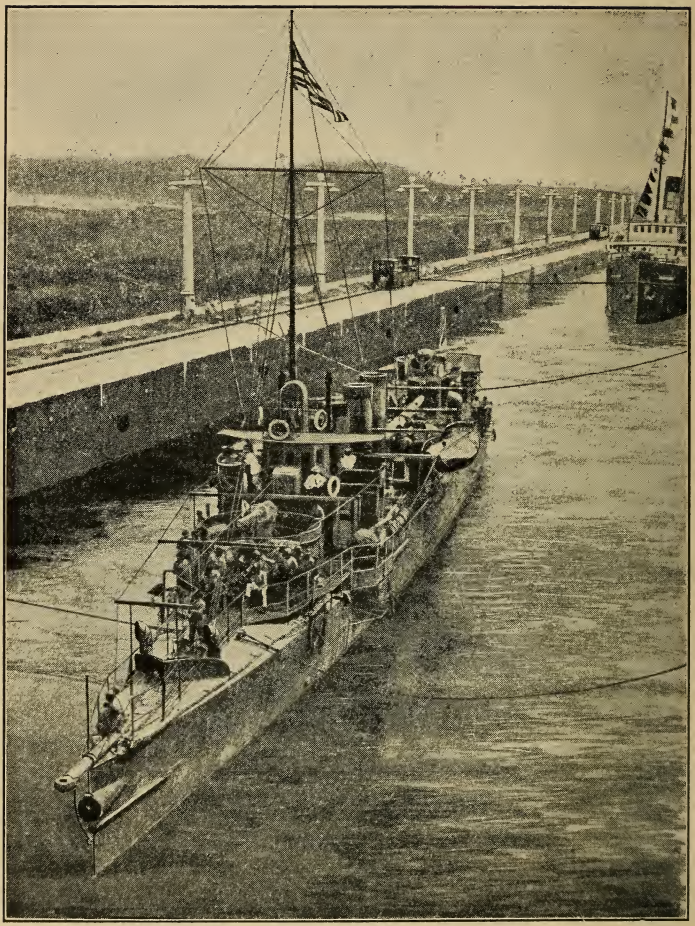
L. R. BLAICH





Frontispiece, Blatch's Three Industrial Nations.

Opening of the Panama Canal

THREE INDUSTRIAL NATIONS

AN INDUSTRIAL GEOGRAPHY OF ENGLAND, GERMANY, AND THE UNITED STATES

BY

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SUPERVISING PRINCIPAL, PUBLIC SCHOOLS
INDIANAPOLIS, INDIANA

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PREFACE

Three Industrial Nations has been prepared for grammar grade pupils whose study of Geography in the intermediate classes has given them a sufficient basis for an understanding of the data herein contained. It assumes that man's industrial activity, growing out of his reaction on the earth's natural resources, is the chief subject of study in Geography. The book is, therefore, an elementary industrial text.

During the last decade the public has asked that the schools lay stress on essentials, and that our courses prune away incidentals, seeing that the limitations of time and of the physical and mental powers of the child preclude the study of everything. Hence, instead of following the time-honored custom of treating all the corners of a continent, important and otherwise, in a single volume, three of the leading nations of the earth have been chosen.

The selection of the United States as one of the three is self-evident. England and Germany have been chosen as the others not only on account of their industrial efficiency and importance, but also because of their close racial relations to our own country. Each has remarkable characteristics and each has accomplished much to be proud of. Great Britain has compelled the admiration of the world by its victorious, service-rendering invasion into every quarter of the globe. Germany has excited the wonder of the world by its unparalleled reformation of industrial affairs under a strong centralized government, and by its sub-

sequent commercial activities in every foreign country. The United States has amazed the world with its unsurpassed development of its rich natural resources.

In his "America's Interest in International Conditions," A. T. Mahan says: "The study of international interests is the one basis of sound policy for statesmen. This involves a wide knowledge of contemporary facts as well as power to appreciate them; but for a nation to exert its full weight in the world, such knowledge and appreciation must be widespread among its plain people also."

It is hoped that the pupils will be helped to understand the enthusiasm of the distinctive national spirit of each country as it is presented; and thereby so enlarge their personalities as to become consistently international, catching from each nation the best it has to offer. We are more than citizens of the United States; we are world citizens. In order that the children may serve their own country best they must receive a broad, intelligent, appreciative view of the highest modern spirit of each nation.

This volume is presented to the boys and girls not as a memory text, but as a book to set them thinking. It is hoped that the recitations which center around it will be symposiums in which pupils and teacher, in the presence of the open book, will read, question, explain, enlarge, illustrate; and always look up in the atlas every place mentioned in the text at the time it is under discussion, until by and by these geographical names will become household friends.

Furthermore, it is hoped that when the study of this book is finished, the young people will be at least a little better prepared to serve the larger problems and higher ideals of the Greater United States of to-morrow.

LYDIA R. BLAICH.

MAP OF

THREE INDUSTRIAL NATIONS

British Empire, German Empire, United States

Their colonial possessions, and the principal commercial routes and telegraph lines of the world.

90° 120° 150° 180° 150° 120°
ARCTIC
RUSSIAN EMPIRE
SIBERIA
Yenisei R.
Lena R.
Irkutsk
Lena R.
Sea of Okhotsk
Amur R.
MANCHURIA
MONGOLIA
Vladivostok
Peking
Tientsin
Kiaochow
Weihaiwei
Japan Sea
Nagasaki
Yokohama
TIBET
CHINA
Shanghai
Canton
Hongkong
PHILIPPINE ISLANDS
Manila
Saigon
Singapore
Calcutta
Madras
Bombay
Bangkok
CEYLON
Colombo
INDIA
BURMA
SIAM
BORNEO
CELEBES
JAVA
Batavia
COCOS IS.
INDIAN OCEAN
AUSTRALIA
Albany
Adelaide
Melbourne
TASMANIA
Hobart
Sydney
NEW GUINEA
BISMARCK ARCH.
SOLOMON IS.
NEW HEBRIDES
NEW CALEDONIA
Noumea
NORFOLK I.
Suva
FIJI IS.
Auckland
NEW ZEALAND
Wellington
CHATHAM IS.
KERMADEC IS.
TROPIC OF CANCER
WAKE I.
GUAM
MARIANAS
CAROLINE IS.
MARSHALL IS.
GILBERT IS.
MIDWAY I.
HAWAIIAN IS.
Honolulu
FANNING I.
EQUATOR
UNION IS.
SAMOA IS.
TUTUILA
TONGA IS.
ELLICE IS.
MARQUESAS IS.
SOCIETY IS.
TAHITI
Apia
Pago Pago
DATE LINE
INTERNATIONAL DATE LINE FOR SHIPPING
SUNDAY MONDAY
INTERNATIONAL DATE LINE FOR ISLANDS
Bering Sea
Dutch Har.
ALEUTIAN IS.
St. Michael
Some
Yukon R.
Dawson
Mackenzie R.
ALASKA
DOMINION
Sitka
Prince Rupert
Vancouver
Seattle
Portland
San Francisco
UNITED
MEXICO
Yangtze R.
Hwang Ho
Ganges R.
Irrawaddy R.
Mekong R.
Menam R.
Malacca Str.
Sunda Str.
Torres Str.
Cook Str.
Bass Str.
Gt. Australian Bight
Gt. Barrier Reef
Coral Sea
Timor Sea
Arafura Sea
Java Sea
South China Sea
Celebes Sea
Banda Sea
Tasman Sea
Solomon Sea
Gulf of Carpentaria
Gulf of Papua
Gulf of Tonkin
Gulf of Siam
Gulf of Martaban
Bay of Bengal
Arabian Sea
Andaman Is.
Nicobar Is.
Laccadive Is.
Maldive Is.
Chagos Archipelago
Amirante Is.
Seychelles
Comoro Is.
Mauritius
Rodriguez
Reunion
Madagascar
Diego Garcia
Cocos Is.
Christmas I.
Keeling Is.
Ashmore Is.
Cartier I.
Timor
Flores
Sumbawa
Lombok
Bali
Sumatra
Nias I.
Mentawei Is.
Enggano I.
Simalur I.
Banka I.
Billiton I.
Karimata Is.
Natuna Is.
Anambas Is.
Tambelan Is.
Borneo
Palawan
Mindoro
Luzon
Formosa
Hainan
Riu Kiu Is.
Bonin Is.
Volcano Is.
Marcus I.
Wake I.
Guam
Marianas
Caroline Is.
Marshall Is.
Gilbert Is.
Ellice Is.
Ocean I.
Fanning I.
Union Is.
Samoa Is.
Tutuila
Tonga Is.
Fiji Is.
New Hebrides
New Caledonia
Norfolk I.
Kermadec Is.
Chatham Is.
Auckland Is.
Campbell I.
Macquarie I.
Antipodes Is.
Bounty Is.
Snares Is.
Solander I.
Stewart I.
Foveaux Str.
Cook Str.
Hokianga
Auckland
Wellington
Hobart
Launceston
Port Phillip Bay
Melbourne
Albany
Adelaide
Port Augusta
Spencer Gulf
Gt. Australian Bight
Sydney
Newcastle
Brisbane
Gt. Barrier Reef
Coral Sea
Torres Str.
Gulf of Carpentaria
Arafura Sea
Timor Sea
Timor
Java Sea
Batavia
Singapore
Malacca Str.
Sunda Str.
Bay of Bengal
Andaman Is.
Nicobar Is.
Calcutta
Madras
Bombay
Colombo
Laccadive Is.
Maldive Is.
Chagos Archipelago
Amirante Is.
Seychelles
Comoro Is.
Mauritius
Rodriguez
Reunion
Madagascar
Diego Garcia
Cocos Is.
Christmas I.
Keeling Is.
Ashmore Is.
Cartier I.
Arabian Sea
Gulf of Aden
Red Sea
Persian Gulf
Gulf of Oman
Aden
Muscat
Socotra I.
Perim I.
Kamaran I.
Hanish Is.
Farasan Is.
Suez Canal
Port Said
Alexandria
Cairo
Nile R.
Mediterranean Sea
Gibraltar
Malta
Cyprus
Crete
Rhodes
Asia Minor
Constantinople
Black Sea
Caspian Sea
Baku
Batum
Tiflis
Persia
Afghanistan
Kabul
Kandahar
Herat
Quetta
Baluchistan
Karachi
Bombay
Poona
Madras
Pondicherry
Trincomalee
Colombo
Ceylon
Bangalore
Hyderabad
Nagpur
Jubbulpore
Allahabad
Lucknow
Agra
Delhi
Cawnpore
Benares
Calcutta
Darjeeling
Assam
Burma
Rangoon
Mandalay
Irrawaddy R.
Siam
Bangkok
Menam R.
Malacca
Penang
Singapore
Malacca Str.
Sunda Str.
Java
Batavia
Sumatra
Borneo
Celebes
Philippine Islands
Manila
Luzon
Mindoro
Palawan
Formosa
Hainan
Canton
Hongkong
Shanghai
Yangtze R.
Hwang Ho
Peking
Tientsin
Kiaochow
Weihaiwei
Nagasaki
Yokohama
Japan
Japan Sea

COLONIES, ETC.

- British Empire
- German Empire
- United States

COMMUNICATIONS

- Principal steamship routes. The heavier blue lines show the most important ocean routes. Figures indicate the distance in geographical miles between places marked thus ⊙
- Submarine telegraph cables.
- Principal railroads.
- Caravan routes.

MAP OF THE WORLD
SHOWING
BRITISH EMPIRE, GERMAN EMPIRE AND UNITED STATES,
COLONIES, ETC., PRINCIPAL COMMERCIAL ROUTES AND TELEGRAPH LINES

SCALE OF GEOGRAPHICAL MILES

On the Equator
0 500 1000 1500 2000

On the 30th Parallel
0 500 1000 1500 2000

On the 60th Parallel
0 500 1000 1500 2000

COLONIES, ETC.

- British Empire
- German Empire
- United States

COMMUNICATIONS

- Principal steamship routes. The heavier blue lines show the most important ocean routes. Figures indicate the distance in geographical miles between places marked thus ⊃
- Submarine telegraph cables.
- Principal railroads.
- Caravan routes.

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THREE INDUSTRIAL NATIONS

THE WORLD'S INDUSTRIAL PROGRESS

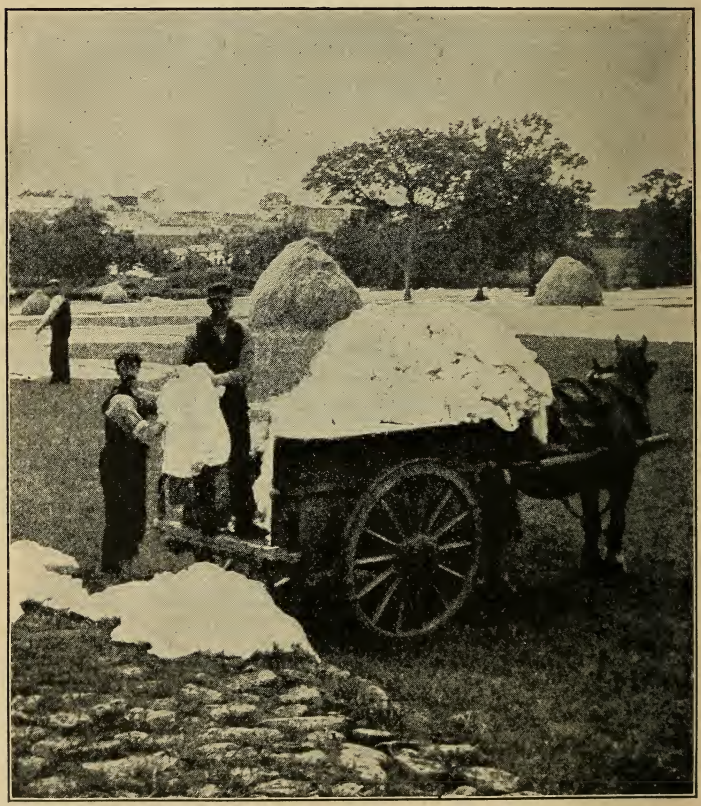
CHAPTER I

A TRIP AROUND THE WORLD IN OUR TOWN

The Kinship of the World. — Did it ever occur to you how much akin the whole world is? The familiar articles all around you speak of the service of your far-away, unknown brothers and sisters.

The Parlor. — Look about your parlor. The rug on the floor may have come from Turkey. The Japanese print adorning the wall traveled thousands of miles across the Pacific from Yokohama to San Francisco, before it came to your house. The mahogany of the piano came from forests in Mexico or Central America. The bulbs which have grown into the beautiful tulips on the stand came from Holland.

The Dining Room. — The tablecloth of Irish linen came direct from Belfast. The dishes of Haviland china were made in France. The coffee very likely came from Brazil, for that country produces three fourths of the world's supply; and the sugar probably was imported from Cuba or Hawaii, for these islands supply much of the world's



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Bleaching linen, Belfast, Ireland.

An ostrich farm.

sugar. The Swiss cheese was made among the famous Alps. The Malaga grapes were grown in Spain. These, and many other things, were brought by steamers and trains from distant lands in order to add to your pleasure and welfare.

The Kitchen. — If they could speak, the kitchen utensils would tell many interesting stories. The enameled granite ware might tell a German tale, and the carving knife might speak of busy Sheffield in England. The cork in the vinegar jug could entertain you for an hour with the story of the Spanish cork tree.

The Wardrobe. — Father's cheviot suit was made of cloth that was woven at Manchester, England, from wool of sheep that fed on the hills of Scotland. The threads in mother's silk dress were spun by silkworms that fed on Chinese mulberry leaves. The plume on her hat came from the famous ostrich farms of South Africa. Sister's fancy hair ribbon, with the gay flowers and butter-

flies woven into it, came from France. Her lace collar was made by Belgian women in Brussels.

Ornaments and Toys. — The diamond in mother's ring rested years ago in South African soil. One day it was picked up and shipped to Amsterdam, Holland, and from there was sent to an American jeweler. Baby's toys were imported from Germany, and the ivory handle of your paper knife came from the tusk of an African elephant.

A Walk through Our Town. — Let us walk along the streets of our town. If our eyes are wide open, we may see many people of other countries. Those Italians digging a sewer came from sunny Italy. A few blocks away some negroes are paving the street. Their ancestors were brought from Africa centuries ago. The Chinaman in the laundry at our right, and his cousin who has the chop suey restaurant next door, once cultivated rice fields in Asia.

The Department Store. — By and by we enter a ten-story department store, where we find French kid gloves, German yarn, Swiss cuckoo clocks, Austrian glassware, Italian corals, English china, Russian leather goods, Egyptian dates, Chinese tea, Japanese screens, and Persian rugs.

The Circus Parade. — As we leave the store, a circus parade passes by. Here are the elephant, camel, and tiger from Asia; the rhinoceros, hippopotamus, monkey, giraffe, lion, and antelope from equatorial Africa; the anteater and boa from South America; the cockatoo, lyre-bird, and kangaroo from Australia. Each of these animals had a long trip across the seas before it reached our town.

The Public Library. — After the parade has passed we enter the public library. On the shelves we find many books written in strange languages, — French, Russian, German, Hebrew, and Spanish. They were printed in

Paris, Petrograd, Leipzig, and Madrid. Although we may not be able to read them, we begin to realize how civilized men the world over are busy thinking.

Our Service to the World. — Is it not wonderful how much the nations of the world have given of their products, their labor, their people, their words, their thoughts, their culture and refinement to us that we may live good and

Selling rugs, Persia.

happy lives? Now what do we give the world in return for these many services? Fortunately, ours is a wealthy land and we have many blessings which we gladly share with others. We send to our brother nations cotton, iron and steel, wheat and flour, and petroleum. Our inventions also find their way into foreign towns the world over, — reapers, plows, cotton gins, sewing machines, telephones, phonographs, and typewriters. The books written by our

great thinkers are translated into foreign languages; for instance, the speeches of Abraham Lincoln, the Declaration of Independence, the poems of Longfellow, the essays of Emerson, and the Indian tales of Cooper. Not a few are the lessons of alertness in business, of daring in times of hardship and difficulty, as well as of large-hearted hospitality that foreigners have learned from the young Republic.

The Value of Exchange. — This exchange of products is called commerce. It is one of the chief means of industrial progress and civilization. The wants of the Indian, as Columbus found him, were few. His food consisted of game and berries found in the forests, and maize cultivated by the squaws. His clothes were simple; his house was a tent of skins. Each family supplied its own needs. There was little trade between tribes; and as for exchange of products across the seas, such a thing was altogether unknown. How different is the case with civilized man. He draws upon the whole world for necessities and luxuries. Many advantages of modern life would be impossible were it not for this giving and taking which goes on between the nations.

Questions and Exercises

1. Study your own neighborhood, and make a list of products that have come from other parts of the world.

2. Point out on the map or globe all the places mentioned in this chapter.

3. Visit a department store, and find out from what places its stock has come.

4. On the globe trace the ocean voyages which six articles in your home made in order to reach you.

5. Visit the place in which your father or some other relative works. What articles made there are sent abroad? Where? What foreign people then are served by that establishment?

CHAPTER II

THE LAND, THE ARENA OF INDUSTRIAL PROGRESS

Man, a Land Creature. — Although the ocean is so inspiring and helpful, man is always glad to put his foot upon land again after a trip on the seas. For man is a land creature. He may roam on the ocean for weeks and even months; but by and by he must turn in again to the harbor for provisions, if for no other reasons. No man has ever been known to spend all his days upon the water, while billions of folks have lived and died upon the land without one glimpse of the sea.

A canyon.

Features of the Land. — The land presents a great variety of features. There are long stretches of soft green meadows; hills where sheep and cattle roam; mountains covered with dark, deep forests, and honeycombed with rich mines; canyons with walls of exquisite colors, exceeding

in beauty anything the mind of man can imagine; narrow chasms with steep, green-clad slopes, and silvery streams flowing at the bottom; volcanoes breathing out ashes and lava; abrupt precipices over which gigantic waterfalls tumble; unlimited fields of golden grain; majestic snow-clad peaks; and boundless plains of sand, as yet unfruitful, awaiting the wisdom of man to discover their usefulness.

Land and Water. — The water covers seven tenths of the globe, while the land occupies only three tenths. Over two thirds of the land is north of the equator, so that nearly half of the Northern Hemisphere is land, while more than four fifths of the Southern Hemisphere is water. In the order of size, the continents rank as follows: Asia, Africa, North America, South America, Europe, and Australia. There is considerable difference in coast lines, which in the past have had much to do with the development of nations. Europe is the most irregular, followed in order by Asia, North America, South America, Africa, and Australia. In general, those countries that have been most closely connected with the sea through their irregular coasts have made the greatest progress.

Man's Progress Due to Two Causes. — The progress man makes is dependent chiefly upon two great causes; the natural conditions of his surroundings, and the nature of man himself. The resources that nature supplies vary greatly in different localities, both as to quantity and quality; and the talents of men differ also. These are among the reasons why there are different degrees of civilization.

Progress Depends on Soils. — Man cannot exist without food, clothing, and shelter. For most of these he must look to the soil. Grains, vegetables, fruits, textile plants, and trees grow out of the ground, and the abundance of

plant life depends very largely upon the fertility of the soil. Some sections, like the Mississippi Valley, are unusually fertile, and become the homes of progressive peoples. Others, like the Sahara, with their unlimited stretches of sand, support very little population.

Life on a desert.

Climate Determines Progress. — Without light, heat, and rain, the soil is unable to produce life of any kind. Sunshine is overabundant in some places and too scant in others to produce the best results. In the equatorial belts of South America, Africa, and Asia, excessive sunlight and rain produce rank vegetation; and the dense forests and jungles are the homes of many large, wild animals. The heat and moisture of these regions weaken the people, and as a result, the plant life remains uncontrolled, the animals are not domesticated, and there is a general lack of industrial enterprise. Life remains primitive and progress is slow.

The frigid zone is still more unfortunate. Here the sunshine is too limited. The darkness lasts long and the cold

Eskimo family, Alaska.

is intense. Moisture comes in the form of snow and ice. The ground is frozen several feet deep — a serious handicap to mining and quarrying. In the absence of quarries and trees, a very important building material consists of blocks of ice. The Eskimo supports himself by hunting wild animals. The flesh of these animals is used for food, the skins for clothing, and the bones are used to make furniture. There are no factories, no surplus products for commerce, no schools, and no signs of advanced civilization.

The temperate regions of the northern and southern continents are best for human development. There the

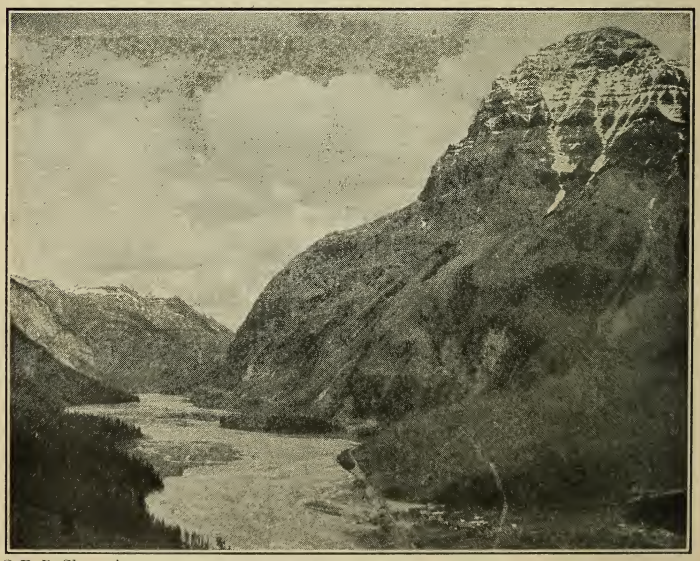
heat, light, and rainfall enable man to produce the largest and best crops. The climate is varied, so that man is compelled to provide in seasons of plenty for the months when nature demands a rest. The hard labor required, together with the good returns it yields, develops man to the highest plane. In the temperate belt are found the busiest farms, factories, harbors, and trade routes; and here the greatest industrial nations have been developed.

Winds play an important part in man's welfare. They distribute heat and cold in such a way as to bring profit or loss to man. It is the winds that carry life-giving vapors from the ocean to the land. Comparatively few people can live in places that the winds visit with a dry, hot breath, as in some parts of Arabia. Where the breezes spread their balmy, moisture-laden wings, as they do over western Europe, there thrive the foremost nations.

Surface, a Factor in Progress. — The height of the land varies from depressions below the sea level to elevations of several miles. Swamps are a drawback to industry. Low,

A farm in a level plain.

level plains are, on the whole, places where men thrive best. Hills and mountains are often the scenes of prosperous communities because the grass gives rise to dairying, or the trees afford excellent timber. Mountains often keep cold winds from a territory that would otherwise be exposed, thereby giving to some lands special opportunities for progress. Such is the case with the Alps, which insure Italy a semitropical climate. Mountains increase the productivity of the soil by condensing the moisture of rain-laden winds. High peaks, such as those of the Rockies, Sierras, and Cascades, are too cold to be centers of industry; yet their snow-covered sides are reservoirs of moisture from which thousands of fertile acres below may be irrigated, and thus become the homes of many families.



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Mt. Stephen, Rocky Mountains, Canada.

Minerals Contribute to Progress. — Regions rich in coal, iron, gold, and stone are busy centers of industry, and support some of the largest populations. The supremacy of the foremost nations of to-day is largely due to their possession of an abundance of coal and iron, which are the two most useful minerals.

Rivers and Lakes Promote Development. — The water on the land, as well as that of the ocean, is of great value in industrial progress. Rivers and lakes supply fish for food. Without streams, successful farming would be out of the question. Rivers are quite as helpful in draining as in watering the land. Factories are run by power furnished by waterfalls. And, finally, waterways furnish cheaper transportation than railroads.

Industrial Progress Depends on Man Himself. — The inherent qualities in men themselves are the most important factor in their progress. Thus far the white race has taken the lead in civilization. The characteristics which have given the white man his preëminence are love of work, ability to endure hardships, love of adventure, a desire for wandering, a spirit of independence, inventive genius, and the power to adapt himself to new conditions. These qualities have given the world the busiest workshops, the most active trade, and the best governments.

Questions and Exercises

1. Name several parts of the earth where there are long stretches of soft, green meadows; large, sandy plains. Locate some canyons in the United States. Do you know of any volcanoes? Where are they? How far would you have to travel from your home to reach snow-clad peaks? In what direction would you go?

2. Trace the outlines of all the continents on the map. Make a list of chief coast waters of each. How do the coasts compare in number of indentations?

3. Draw a line to represent the equator. Sketch the outline of each continent that is wholly or partly north of the equator. Of each one south of it. Compare the land masses of the two hemispheres as to extent.

4. Make a collection of pictures of the races of men. Indicate on the map the home of each.

5. What nations control Africa? Australia?

CHAPTER III

THE OCEAN, AN IMPORTANT FACTOR IN INDUSTRIAL PROGRESS

The Sea, a Mighty Phenomenon. — The mightiest natural phenomenon on earth is the sea, whose waters cover more than seven tenths of its surface. The greatest depth of the ocean (near the Philippines) is about six miles, only a little greater than the greatest height of mountains (Mt. Everest in the Himalayas). Its average depth, however, is five times the average height of the land. Therefore the volume of the ocean is thirteen times that of the land above sea level. The largest ocean, the Pacific, is four times as large as the largest continent, Asia. The Atlantic is twice as large as both Americas; the Indian Ocean could spread over Africa twice and still have ample water

Breakers at Atlantic City, New Jersey.

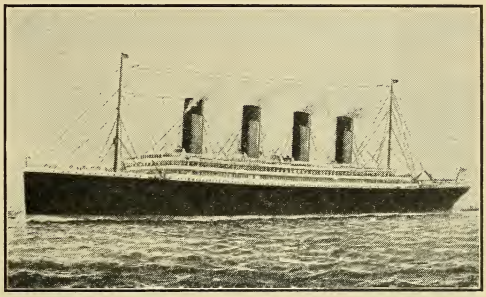
left to cover Australia; and the Arctic Ocean is larger than Europe. The Antarctic lands and waters have no industrial importance.

Great Ocean Distances. — The oceans are so wide that the distances across them are measured in terms of thousands of miles. Across the Atlantic, for instance, from New York to Liverpool, the distance is 3,042 miles; from New York to Cape Town, 6,795 miles. Across the Indian Ocean, from Aden, Arabia, to Melbourne, it is 6,489 miles. Pacific voyages are still longer: 4,202 miles from Yokohama to Vancouver; 9,452 miles from Manila to Panama via Honolulu; 10,076 miles from Hong Kong to the southern point of South America. It takes large steamers eighteen days to go from Hong Kong to Vancouver; nineteen from Colon to Liverpool; twenty from Aden to Albany, Australia; twenty from Rio de Janeiro to Southampton; and twenty-five from Sydney to Panama.

Unity of the Waters of the Earth. — Man stands in awe of the vastness of the waters of the earth. The close connection of all their parts is no less remarkable. You can pass from ocean to ocean without knowing where one begins and the other ends. Every indentation along any coast opens into the deep sea. With the exception of salt lakes and their tributaries, every lake, stream, and brooklet hurries toward and ultimately reaches the ocean — the all-father of waters. The ocean, then, is an unbroken connecting link joining nations.

The Ocean, a Carrier of Commerce. — The ocean, which was formerly a dreaded barrier separating countries, has recently become a friendly highroad connecting them. In our time it makes possible busy workshops, a wonderful world commerce, and the universal brotherhood of man.

The sea is international property, and is thus a great highway that is open to all nations. Four fifths of the trade between nations is carried on the sea. A ship can be moved through water with less power than a train of the same weight can be moved on a railroad, and therefore the transportation of freight by water is cheaper than by land. Moreover, ships require no ballasted roadbed to give security, no wooden ties to support the weight, and no iron rails to guide the passage. The saltness of sea water lowers the freezing point below that of fresh water; and, as a result, the harbors on the seacoast, except those in very cold latitudes, are open to commerce throughout the year, while the harbors on lakes of fresh water are, in many instances, ice-bound during the winter.



A modern steamship.

In the sea there are periodic movements of the water called tides. These are great waves of water rising and falling twice each day, usually with an interval of twelve hours and twenty-five minutes between high tides. As these waves reach the coast they push the water up the rivers, thus making a considerable increase in the depth of water. Thereby ships are enabled to steam many miles upstream. This gives inland cities, like Hamburg, Liverpool, and London, excellent oceanic trade advantages, while they are, at the same time, protected from coast storms.

Ocean Products. — The ocean not only carries commerce, but it also yields many important products. Millions of pounds of fish are annually lifted from its depths. The chief food fishes are cod, herring, salmon, and mackerel. Whales, seals, walruses, and sea otters are other sea animals, yielding such products as oils, furs, and ivory. Much wealth is represented in the annual catch of oysters consumed by man. The greatest fishing grounds in the world are off the west coast of Europe, the Atlantic coast of North America, and the Pacific shores from San Francisco to Alaska. Hundreds of thousands of Europeans and Americans are engaged in the fishing industries.

©

A fishing fleet.

Seaweeds yield valuable fertilizers, iodine, and other chemicals. The Chinese cure certain of the weeds and use them as food. Sponges are found off the Bahama and Flor-

ida coasts. Pearls are gathered at Ceylon; amber is found along the shores of the Baltic; and coral is obtained from various tropical islands.

The Source of the Rain. — A large amount of water in the form of vapor rises from the sea, and is wafted by the wind to the land, where it falls as rain or snow. Thus the ocean contributes the moisture that is necessary to plants, animals, and man, and so helps to create the food, the lumber, and the textile products which later it assists in distributing.

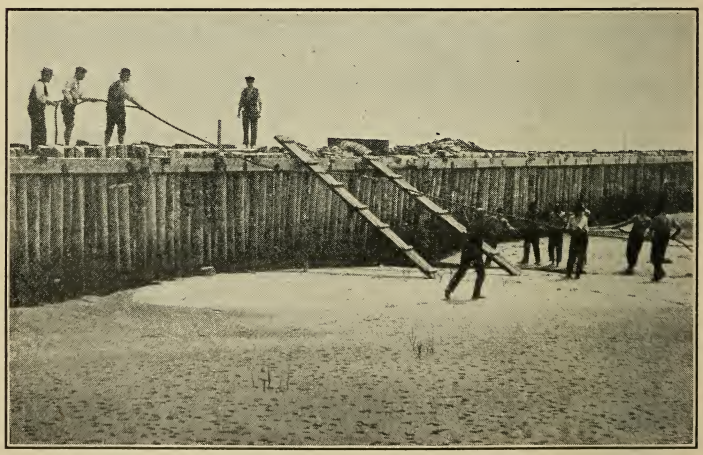
The Oceans are International Property. — The oceans belong to all nations. Beyond the three-mile limit, people of any country may fish and trade to their hearts' content. Each nation is entitled to all the space it can possibly use.

The Ocean, a Factor in National Greatness. — Enterprising nations through their ocean commerce have amassed great wealth. England is said to have increased hers a thousandfold in the nineteenth century. Most of the seafaring nations have acquired large colonial possessions. This has been true of the Romans, the Spaniards, and the Portuguese in the past. At present the people of the North Sea countries, the United States, and Japan are the great ocean travelers. The English outstrip all other nations in colonial enterprise, as well as in oceanic trade. Our country has the oceanic spirit and is to-day England's greatest commercial rival. By overcoming the dangers and hardships of the sea, seafaring people have developed great physical strength, unflinching courage, and keen intellect.

The Indian Ocean. — While we Americans take little interest in the Indian Ocean, wide-awake European countries fully appreciate its value as a carrier of merchandise which passes through the Mediterranean Sea and the

Suez Canal on the way between Europe and Asia, Africa, or Australia. The many ships of many lands that sail over this tropical sea give proof of the brotherhood of man in the Eastern Hemisphere. In addition to them, the cables at the bottom of the Indian Ocean give to the people of far-away Australia interests in common with those of Asia and Africa.

The Atlantic Ocean. — At the present time, the Atlantic Ocean is the world's greatest international trade artery. This is due to several causes. It connects the most capable industrial nations. The most extensive land slopes of Europe and the Americas face this body of water. Many of the world's largest and commercially most active rivers, such as the Mississippi, the Amazon, the Nile, and the Rhine, carry their merchandise to the Atlantic. Much of this ocean lies within the temperate zone. The smaller width of the Atlantic as compared with the Pacific makes



Landing an ocean cable, Coney Island, New York.

freight charges less. No other ocean is so well supplied with safe natural harbors. There are seventeen transoceanic cables across the Atlantic, whereas only two connect the opposite shores of the Pacific.

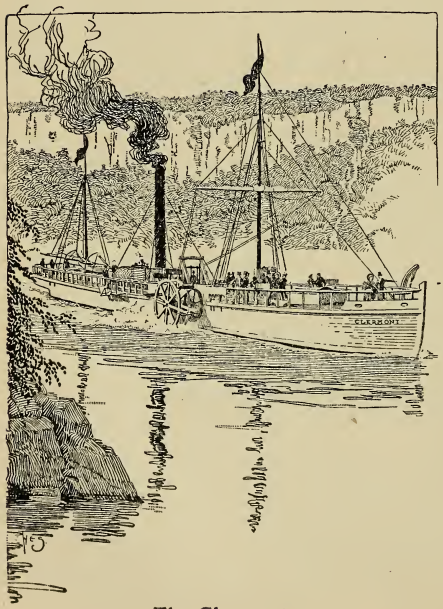
Of all the arms of the Atlantic, the North Sea and the Mediterranean have been the most prominent international trade routes, because of the powerful nations adjoining them. In our own time no other body of water is so crowded with steamship lines and submarine cables as the North Sea. In ancient times, when the Mediterranean was the center of the known world, it was by far the most important commercial waterway. It carried the navies of Egypt, Phœnicia, Greece, Carthage, and Rome. The decadence of these powers and the rise of northern and western Europe caused it to decline in importance. But with the opening of the Suez Canal in 1869 Europe and Asia were brought closer together, and a mighty impetus was thereby given to Mediterranean business.

The Gulf of Mexico and the Caribbean Sea will undoubtedly rival in importance the European arms of the Atlantic on account of the Panama Canal.

The Pacific Ocean. — Many of the highest mountain chains in the world lie near the Pacific. The shore line of this ocean is strikingly regular, and hence there is a scarcity of good harbors. Before the invention of the steamship, the great width of the Pacific deterred man from using that ocean freely.

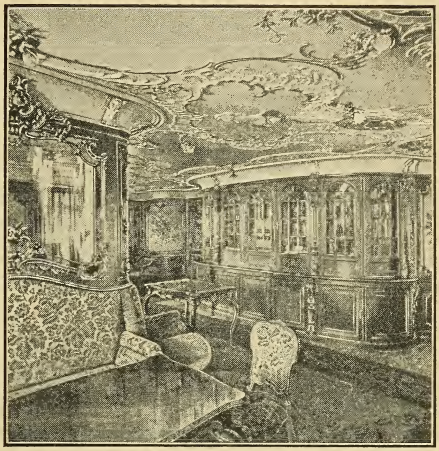
Recently, however, the Pacific Ocean has been gaining rapidly as a rival of the Atlantic. Great powers such as Japan, Russia, the United States, and the British Empire are making it an important commercial highway. Fast steamers and wireless telegraphy are diminishing the

distance between the Americas and Asia. Asiatic countries are awakening to modern progress. Their productivity is growing, and the wants of the people are becoming more varied, which means more business for the Pacific. Moreover, the United States is just well started in the development of her western resources. Steamship lines on the Pacific Ocean are growing in number, and before long more cables will be laid in its depths. At present, there is one long American cable connecting San Francisco with Hawaii and Manila; a British cable between Vancouver, Canada, and Sydney, Australia; and a few minor lines connecting Australia and New Zealand with Asia and near-by islands. As the Pacific becomes a more prominent international highway, its thousands of islands will prove valuable trade centers.



The Clermont.

Steamships.— Only a little more than one hundred years ago, Robert Fulton, an American, built the first successful steamboat, in which he steamed up the Hudson. All the world looked on in amazement at this *Clermont*, in spite of the fact that it was so small, so slow, and so clumsy; for did



Library of a large steamship.

it not travel by steam, and was it not independent of the wind? Since the building of the *Clermont*, steamship construction and travel have made astonishing progress. Fifty years ago an ocean voyage meant weeks of wretchedness and perils. Now it means comfort and comparative safety. Shipbuilders have raced with one another in constructing the fleetest, most sumptuous ocean palaces. We are living in the age of the five-day trip from Europe to America. Ships are now fitted out with elaborate kitchens, fine dining rooms, beautiful reception halls, elegant drawing-rooms, comfortable bedrooms, convenient elevators, writing rooms, libraries, modern bathrooms, swimming pools, and concert halls. The general assembly rooms are decorated with beautiful paintings and sculptures.

There are many steamship lines. Those most familiar to us are the Cunard, White Star, North-German Lloyd, Hamburg-American, Pacific Mail, Japan Mail, and the Oriental. One of the largest steamships afloat at present carries more than five thousand passengers and enough freight to fill a train of cars forty-four miles in length. It is nine stories high above the water line — a real floating skyscraper. This vessel has private dining rooms, a tea

garden, palm gardens, and sun parlors. Telephone service connects the rooms so that persons may communicate with one another without leaving their staterooms. This ship has powerful wireless telegraph apparatus, which enables it to send and receive messages across the width of the Atlantic; so it is always in direct communication with the land. Ocean travel has become as cheap, comfortable, and rapid as land travel. No wonder that the sea no longer separates, but rather unites, the peoples of the earth. Americans may rejoice that their country is most favorably situated with reference to the two most important oceans.

Questions and Exercises

1. Visit a steamship agency. Inquire the cost of a passage across the Atlantic from New York to Liverpool; of a similar ticket from San Francisco to Yokohama. Explain difference in prices.

2. Get a map of steamship lines and play the game of tracing vessels from port to port.

3. Point out on the globe every place mentioned in this chapter.

4. On an outline map of the hemispheres, designate the places where the various ocean harvests are gathered.

5. Make a list of the chief indentations of the Atlantic Ocean. Of those of the Pacific. Chief harbors of each.

6. How much shorter is the trip between New York and Valparaiso, Chile, by way of the Panama Canal than by way of Cape Horn?

7. Find out, if you can, the cost per word of a cablegram from any European port to any American port. Study a cablegram code.

8. What advantages has the wireless over the cable? What disadvantages?

CHAPTER IV

MAN'S DEVELOPMENT OF THE RESOURCES OF LAND AND WATER

The World, a Great Workshop. — Agriculture, mining, manufacture, and commerce are the leading industries by which man secures and prepares the resources of the earth for his own use. In all the industrial activities there is constant progress. The invention of time-saving devices, the irrigation of deserts, the draining of swamps, the harnessing of waterfalls, and the improvement of rivers are some of the ways by which the earth is being converted into a better home for man.

Agriculture. — At first, man obtained his food from wild plants and animals. Later, he began to domesticate them. When seeds were planted in cultivated ground, when the growing crop was cared for, and then harvested and stored for future use, a great advance was made. The herding of domestic animals on natural grass lands may be even an earlier form of farming than the cultivation of plants. Century by century man improved his methods of agriculture. New plants were cultivated and new animals domesticated; and more and more of the earth was brought under cultivation. It will prove interesting to make a list of the most important products obtained by farming.

Reclamation of Deserts. — By irrigation large areas of desert lands have been changed to fertile farm lands. Snow-covered peaks in Colorado, Idaho, Oregon, California,

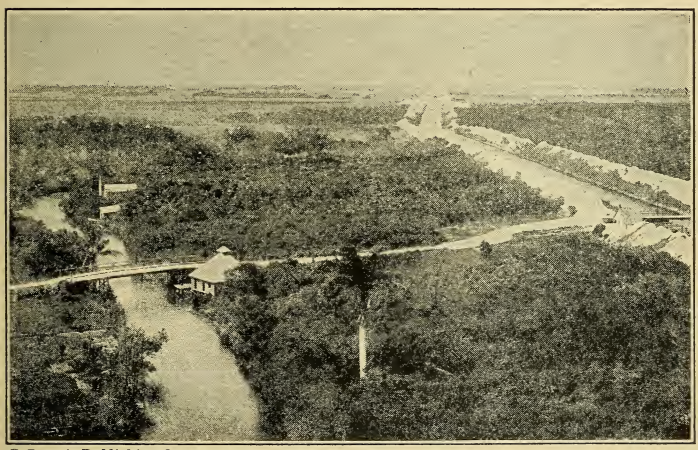
and other states are the fountain heads of rivers whose waters of late years have been tapped and sent in irrigation flumes to thirsty valleys. The water supply is controlled

An irrigation canal, Egypt.

by large reservoirs built among the mountains. The result is that millions and millions of bushels of grain, apples, peaches, nuts, lemons, and oranges have been produced in what were once desert lands. We owe this extra wealth to the brain of man, who discovered how to turn these waste lands into fruitful gardens. Large areas in Spain, Italy, Egypt, India, and Australia also are irrigated.

In some regions artesian wells bring to the surface the water from underground supplies. Large areas in Texas, South Dakota, and other western states are irrigated by these flowing wells. In places where the water does not reach the surface in the wells, it is pumped up by engines and windmills, and thus made available for irrigation. In the oases of the Sahara desert the underground water rises to the surface in natural wells, and date palms and cereals grow in the moist earth. Perhaps by means of wells the Sahara may some day become a fruitful paradise.

Drainage of Marsh Lands. — In contrast with the dry regions are others that are water soaked and flooded. Such was the condition of nearly half of the country of the Netherlands, much of which lies below the level of the sea. The Dutch turned the unhealthful marshes into rich grass lands by constructing drainage canals and great sea walls to keep the water out. On the meadows, which have been wrested from the ocean, fine cattle are raised, and dairying is an important industry on these recovered lands. Large quantities of butter and cheese are exported. The United States has many swamps that need to be drained. The levees built along the Mississippi have reclaimed thousands



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A drainage canal in the Everglades, Florida.

of acres. Yet there remain more than 75,000,000 acres of fertile lands in the United States covered by water and rank vegetation, waiting for man to draw great wealth out of them.

The Beginning of the Clothing Industry. — In cold regions, man required clothes. He began by using the skins of animals for this purpose. By and by he learned to make cloth from wool and fibrous plants, from which better garments could be made.

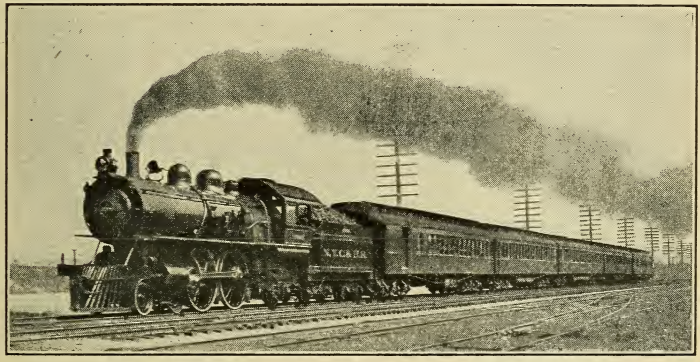
Mining. — To weave the fibers into cloth, and to plant and harvest the crops were difficult tasks in the beginning, owing to the lack of proper tools. But man, the worker, is also the thinker. Year by year, and century by century, his senses grew keener and his brain more and more alert. He found the minerals of the earth and learned to use them. Iron was used to make looms and reapers; coal, petroleum, and gas were burned for heat and light; building stones were quarried for houses; and gold, silver, and precious stones were fashioned into costly ornaments.

Manufacturing. — Thousands of mills, furnaces, and factories in almost all parts of the world give proof of the importance of manufacturing. Iron and steel products, lumber, furniture, bricks and other clay products, flour, and dressed meats are some of the leading products of this industry. If we stop to make a list of all the articles that we have seen in houses, on farms, in streets, in stores, and in factories we may get some idea of the great number and variety of manufactured products.

Commerce. — At first, commerce consisted of barter; that is, the exchange of one article for another. When money came into use the exchange of goods by buying and selling was far more convenient than barter. Commerce not only includes the buying and selling of products, but also the transportation of goods; and with the building of railroads and modern steamships commerce developed very rapidly. To-day carloads of goods move quickly

across the continents and ships loaded with goods glide noiselessly from land to land over the trackless seas. The nations are vying with one another in building railroads and ocean steamships. Modern commerce also depends on rapid communication for making business transactions.

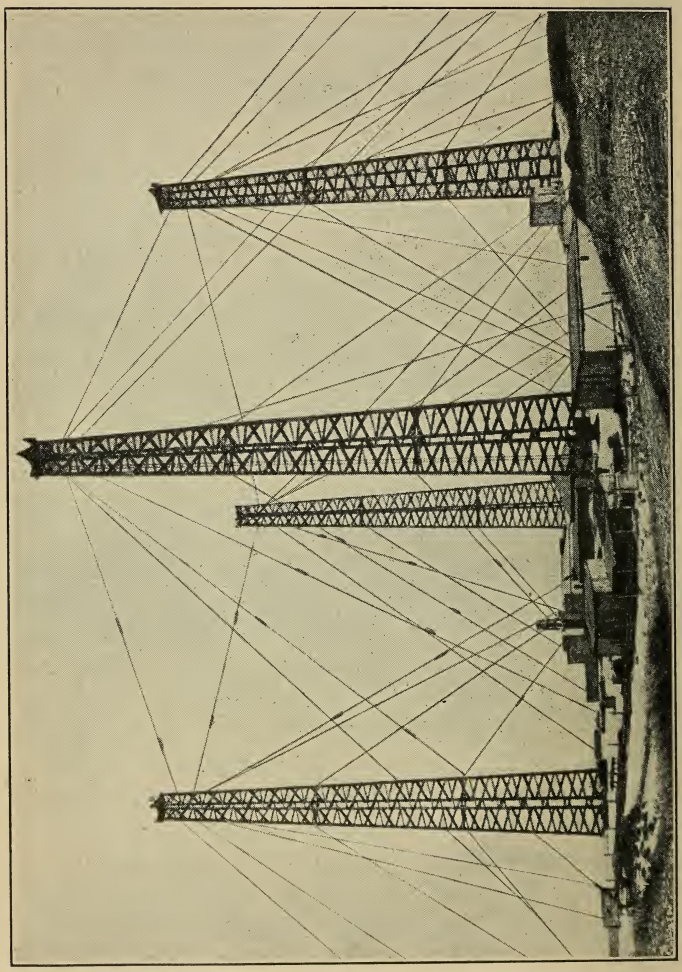
Telegraphs and Telephones. — The whole world has become a great market, and people hundreds and even thousands of miles apart often desire to trade with one another. A century ago business communications were



A modern passenger train.

made by letters that were carried by men on horseback or on stages. To-day letters are carried on fast mail trains; but trains are not sufficiently swift for modern commerce. By telegraph a message can be sent in an hour or two over a distance that would require a day for a fast train.

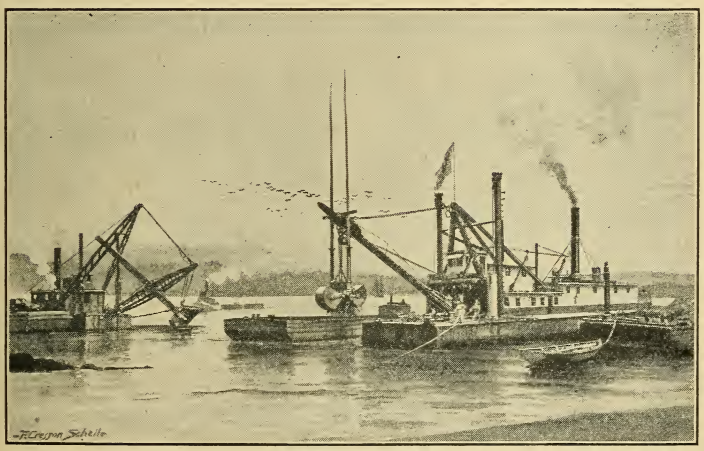
In 1866 the first cable was laid across the bottom of the Atlantic. Now messages from New York to London, which would require over four days for delivery if carried on the fastest ship, can be sent in less than two hours by cable. Still more recently the telephone has contributed



Wireless station, Wellfleet, Massachusetts.

its service to the commercial world. By the long-distance telephone people one thousand miles apart may speak to one another. The telegraph and telephone require wires for their operation. A few years ago Marconi perfected a system of sending messages without wire. By means of the wireless system, stations several thousand miles apart can communicate with one another; and ships in the middle of the Atlantic are in communication with each bordering continent.

Improvement of Rivers. — To-day, the leading nations of the world are giving much attention to the improvement of rivers in order to increase their value to commerce. In places rivers are dredged to keep the channels clear, and stone embankments are built to keep the water in the deep



Dredging a river.

channels. Forests at the headwaters of rivers are being saved from destruction in order to regulate stream flow. In forest lands a large part of the rain is held in the spongy

soil and does not flow off rapidly. Thus, much of it soaks into the ground, and appears again in streams, weeks and even months after the rain falls. In this way the water of rainy seasons keeps the streams full in the dry seasons of the year. When the forests are removed to make room for farms and cities, the rain flows rapidly down the cleared slopes into the streams; in rainy months the streams are flooded, and they have little water in the dry months. Thus navigable streams have become useless rivulets during much of the year. Germany has long given much attention to the improvement of rivers. As a result the Rhine River is to-day worth millions for commerce where formerly it was noted principally for its scenery. Our own Congress is just waking up to the importance of this subject.

Water Power. — In manufacturing, one of the necessary things is power to run the machinery of the factories. When the United States was a young country, swift streams were much used for this purpose. By and by steam power was made available, and the rivers were neglected; for generally a factory with steam power could be built in a more convenient location than that of a water power mill. Years later, when men learned how to distribute power by means of electric wires, they began again to use water power. Dynamos turned by water wheels generate an electric current which is distributed by wires to factories in the vicinity and even to those hundreds of miles away. Many large falls, like Niagara, are harnessed and their strength is turned into electrical power which is used to light cities, propel electric cars, and run machinery. But while many planing mills, cloth factories, flour mills, and aluminum works use the energy of waterfalls, there are still millions of capital lying dormant in our streams.

New Industrial Problems Ahead. — Man has made marvelous advancement, but still there remain many industrial problems for the future to solve. The land was the first element with which man grappled. In comparatively recent times he attacked the ocean with undaunted courage and some degree of understanding. Even yet these two mighty forces — land and water — have not been fully exploited. Undoubtedly there are unused treasures in both that we know nothing about.

The third great element — the air — has received little attention as a factor in industrial development. The invention of airships is the dawn of a new industrial age. The flying machine will enlarge our knowledge of the uses of the air, and present new tasks for solution. When we solve them, the earth will, no doubt, be a better home for man.

Questions

1. What are some of the leading problems of conservation in the United States?

2. What has been done in your town or county to make it better adapted for the home of man than it was when the white race first settled it? Examples of such improvements are good roads, bridges, electric railroads, levees, drainage canals, filling in of swamps, planting forest trees, and harnessing streams for water power.

How does England maintain her high rank in industry and her supremacy in commerce?

THE BRITISH EMPIRE

CHAPTER V

ENGLAND, THE FOREMOST COMMERCIAL POWER ON EARTH

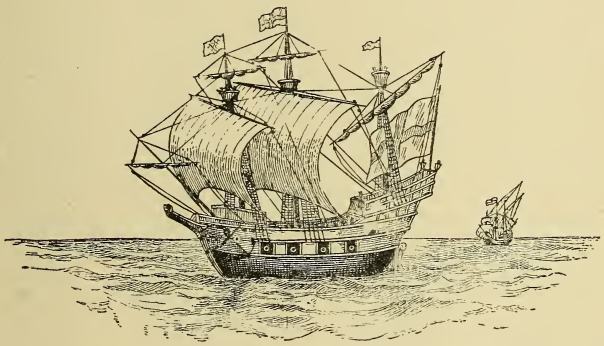
England's Supremacy of the Sea. — In more than one respect the British Empire, of which England is the mother country, has for three centuries been the foremost power on earth. It has taken the lead in industry, commerce, and colonial possessions.

The Empire embraces about one fifth of the land of the earth and claims more than one fourth of the world's inhabitants. But the most astonishing fact about England, a condition which the other nations admire and envy most in her, is her marvelous supremacy of the sea. To attain this superiority has required a long struggle. To-day she owns the largest merchant marine ever controlled by any nation. How did this come about?

Brief Account of English Commercial Supremacy. — The early English population was composed largely of immigrants from European countries — Denmark, Germany, and France. The North Sea and the English

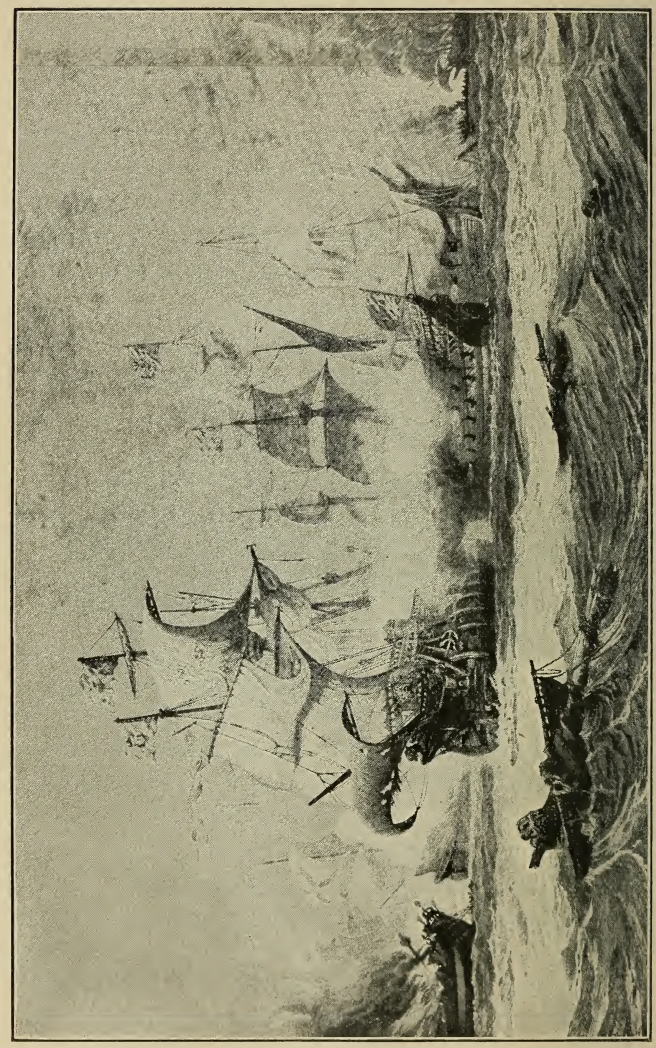
BRITISH ISLES
SCALE OF MILES
0 50 100 150
SHETLAND IS.
MAINLAND
ORKNEY IS.
POMONA
Pentland Firth
Duncansby Hd.
Wick
C. Wrath
Butt of Lewis
LEWIS
N. UIST
S. UIST
Moray Firth
Kinnaird Hd.
Elgin
Banff
Inverness
Peterhead
Aberdeen
Balmoral
Montrose
Arbroath
Dundee
Ben Nevis
Glasgow
Firth of Forth
EDINBURGH
R. Tweed
Malin Hd.
Londonderry
Belfast
Newcastle
S. Shields
Sunderland
Middlesbrough
Scarborough
Donegal Bay
Sligo
Ballina
Westport
Roscommon
Dundalk
Drogheda
IRISH SEA
Liverpool
Leeds
Hull
Humber R.
Gr. Grimsby
Lincoln
Sheffield
Manchester
Derby
Nottingham
Leicester
Birmingham
Norwich
Yarmouth
Lowestoft
Ipswich
Harwich
Cambridge
Northampton
Bedford
Oxford
LONDON
R. Thames
Canterbury
Dover
Calais
Boulogne
Str. of Dover
Brighton
Portsmouth
Bournemouth
Bristol
Cardiff
Swansea
Bristol Channel
Cardigan Bay
Cardigan
St. Georges Channel
Holyhead
Snowdon
Wicklow
Kilkenny
Wexford
Waterford
Dungarvan
Queenstown
Cork
Tralee
Killarney
Limerick
Tipperary
Clonmel
Kingstown
Dublin
Trim
Athlone
Galway
Tuffalo
Kilmarnock
Ayr
Gilvan
Dumfries
Carlisle
Lancaster
Preston
Blackburn
Bangor
Barnstaple
Exeter
Plymouth
Devonport
Truro
Falmouth
Penzance
Lands End
SCILLY IS.
ALDERNEY
CHANNEL
GUERNSEY
ISLANDS
JERSEY
Cherbourg
Havre
Rouen
ENGLISH CHANNEL
NORTH SEA
ATLANTIC OCEAN
Longitude 8 West from Greenwich 4 0 East

Channel were the highroads of intercourse between the island of Great Britain and the mainland of Europe. So, from the very beginning there were active trade relations, which developed into a great commercial spirit that gradually led to a desire for supremacy on the sea. The merchants pushed out farther and farther into the remote seas, until by and by England turned her face not only toward Europe but toward the whole world. In the course of time, England, in common with other European countries,



An English ship of the fifteenth or sixteenth century.

looked with longing eyes eastward to Asia and the East Indies, and westward to the Americas; but she was by no means the leader. In those far-off days of the fifteenth and sixteenth centuries there was glorious rivalry for the dominion of the sea, the conquest of new lands, and new trade. The Portuguese and the Dutch preceded England in the East, and Spain gained the first foothold in the New World. France played a leading rôle in North America, while Spain controlled South America and Mexico. England seemed to hold the fifth place in the commercial race.



Battle between English ships and the Spanish Armada.

But in the sixteenth, seventeenth, and eighteenth centuries she steadily came to the front. Portugal was the first to lose her place; later Spain declined.

England Defeats Spain. — Up to the middle of the sixteenth century, England's rank as a sea power was not high. Spain was the mistress of the ocean. Because of religious and commercial disputes, the two countries were not at all friendly with each other.

Before long England's power burst into bloom. Her daring sea captains were determined to secure some control of the seas. Sir Francis Drake, the leading spirit among them, sailed round the world, and raided Spanish ships and colonies, bringing home an amazing amount of Spanish booty.

In 1585 the Spanish king built a large fleet, known as the Spanish Armada, and declared war upon his enemy. Suddenly Drake appeared in the harbor of Cadiz, Spain, and burned many of the Spanish vessels. On his way home he captured a Portuguese ship laden with valuable merchandise from eastern Asia; it was important as revealing to Englishmen the great wealth that was coming from the trade with the East.

In 1588, the great Spanish Armada, which had been rebuilt and enlarged to 132 vessels, set out to attack England. The latter gave her enemy a disastrous defeat. This was the beginning of the commercial decline of Spain.

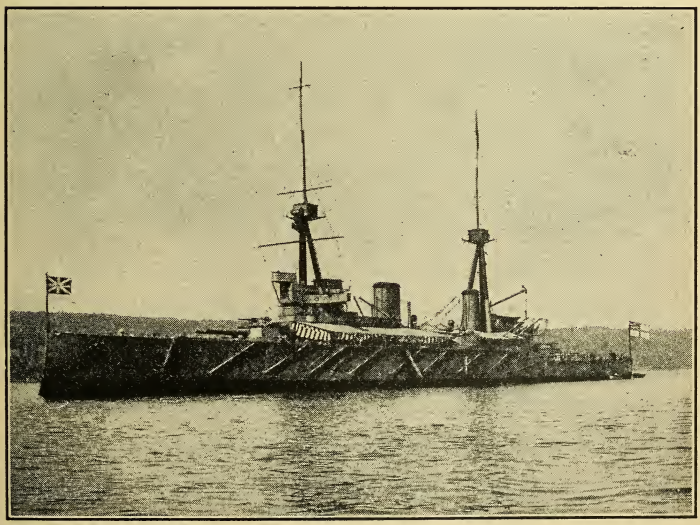
Other English Conquests. — Exultant at their victory over the Spaniards, the English laid new and greater plans for an ocean future than had ever been dreamed of by any other nation. From that time on they faced not only Europe but the whole world. Holland was still in the lead.

Her ships carried most of the world's commerce, including that of England. In order to check Holland and increase their own trade, the English passed laws requiring that all imports into Great Britain or any of her colonies be carried in English ships manned by English sailors. This took from the Dutch much of their foreign trade and left France as the chief commercial rival of England.

The English opened up a vigorous trade with Asia by way of the Cape of Good Hope. They also established the thirteen colonies along the eastern coast of North America, which they finally lost. But just previous to that loss they had gained Canada from France, and wrested India from French control. This left England undoubtedly the foremost among the nations. She opened trade with Africa, took possession of some of the largest and best territory in that continent, and gained control in Egypt. In the course of time the whole continent of Australia fell to her lot. Thus England in commerce and colonies has become greater than any other nation.

Growth of England's Merchant Fleet. — The invention of the steamboat about 100 years ago caused great changes in the British fleets. The *Comet*, the first English steamer, was built four years after Fulton had given the world his invention. She carried twenty-five tons at a speed of three miles an hour. For some time steamers kept close to land. Even as late as 1835 an English scientist declared that a trip to the moon was quite as possible as a steamer voyage across the Atlantic, although the American ship *Savannah*, equipped as both steamer and sailing vessel, had made one fourth of her trip across by steam in 1819. Nevertheless, on April 4, 1838, the *Sirius* (tonnage 703; length 178 feet) with ninety-four

passengers left London for New York, which she reached in eighteen days. The tonnage of steamers has been increased to 55,000; the length to nearly 1,000 feet; and the passenger capacity to 5,000. To enable the steamers to go faster and carry heavier loads wooden ships gave way to iron and steel. In 1839 the United Kingdom owned over 28,000 sailing vessels and only 824 steamers, carrying three and one third million tons in all. By 1910 the sailing vessels were reduced to 9,090; the steamers were increased to 12,000; and the total cargoes to eleven and one half million tons. This does not include the 597 warships which to-day are entirely distinct from merchant vessels. British ships, besides transporting their own products, do a large part of the carrying trade of other European countries and of the United States; in fact most of the



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A British battleship.

world's oceanic merchandise is carried under the British flag. Now let us inquire into the natural causes that have made possible England's leadership in commerce.

Great Britain, an Island. — In the first place, Great Britain is an island. It is composed of England, Scotland, and Wales, but the greatest of these is England, which is known as the mother country of the British Empire. Originally the three countries in Great Britain were independent of one another. England was then also known as Britannia. Wales was conquered and when Scotland was united with England, the name of the kingdom became Great Britain. Great Britain and Ireland together are spoken of as the United Kingdom, or the British Isles. All these names are used to include many small surrounding islands as well as the two large ones.

Influence of the Sea. — It is perfectly natural for islanders to be allured to the ocean. The English cannot resist the call of the sea. For centuries they have been good sailors. Thousands of them learn the ways of the sea as fishermen; for the shallow waters of the North Sea abound in fish. There is no place in England more than seventy miles from the sea.

Near Europe. — The ocean environment, valuable as it is for England, is no more important than the nearness of the mainland. A steamer trip of an hour and three quarters carries one across the English Channel from Dover, England, to Calais, France. Several of the most important nations are only a short distance away. Many steamship lines connect Great Britain with Holland, France, Belgium, and Germany. The plains of Europe, with their busy rivers, the Seine, the Rhine, the Weser, and the Elbe, face the island.

In the Center of the World. — Before 1492, Great Britain was on the edge of the known world. Since the sixteenth century it has been in the center. The New World, with its marvelous natural wealth, helped to make England commercially important.

Good Natural Harbors. — Great Britain is unusually fortunate in the irregularity of its coast. The mouths of many of the rivers are deep estuaries which form good

Docks at Liverpool.

harbors. Englishmen have made use of nature's gifts by building large cities there, including London, Portsmouth, Hull, Bristol, Glasgow, and Liverpool. Due to the warm westerly winds and the northeast flow of the warm surface water of the Atlantic in the same latitude, English harbors are ice free the year round. Small wonder that, with such natural advantages, English ports rank among the largest commercial centers in the world.

High Tides. — At high tide the estuaries of the rivers become arms of the sea on which the largest ships may sail; but while the tides help to make excellent harbors, they are not an unmixed blessing. In London there is a difference of eighteen feet between high tide and low tide. At Liverpool the flood tide rises twenty-four feet above the ebb; in the Severn River, forty feet. Thus a serious problem is presented to the builders of the piers and wharves. A landing place suitable when the tide is low would be entirely submerged when the water reached its high mark. To overcome this difficulty floating landing stages are built, the piers rising or falling with the water. At Liverpool and other points magnificent stone piers surrounding great pools wall the banks of the river. Ships enter these pools of water through water gates. The docks cost large sums of money; but England has spared neither money nor labor in improving her harbors.

Storms and Fogs. — There are many sea storms, especially in the English Channel. Storms have damaged thousands of ships off the English coast. Even more dangerous than the storms are the fogs which hang so heavily over and around England. Along the coasts are many cliffs and sand banks against which ships can easily be dashed to pieces when they are enveloped in fogs, for the lighthouses, of which England has over three hundred, are invisible in the dense fogs.

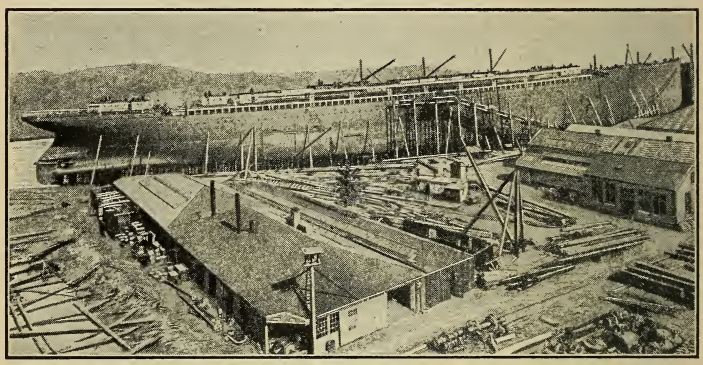
It is well known that London sometimes has such heavy fogs that the streets have to be lighted in daytime, and even then persons become lost near their own homes. Imagine the fear of the people on the many ships that crowd the harbor. It requires great care to keep the vessels from crashing into one another.

Shiploading Conveniences in English Harbors. — At the great seaports are large piers of stone inclosing half a hundred acres of water each, and docks where the largest ocean greyhounds with a tonnage of fifty and sixty thousand tons may load and unload their enormous cargoes. Mighty cranes with their revolving arms and pulleys, lifting fifty tons at a time, swing back and forth between the ship and the piers, carrying sacks, bales, boxes, kegs, barrels, and hogsheads. Oils are pumped from oil tank steamers to harbor tanks or *vice versa*. Grain is transferred not in sacks but in bulk, by machinery with an endless bucket chain such as is used in transferring wheat from a car to elevator bins. Powerful hoists load a ship with coal at the rate of seven hundred tons an hour. At the Immingham Dock near Grimsby 5,000,000 tons of coal can be handled per day. The rapidity with which the work is done is amazing. Gigantic granaries and warehouses, crowded around the wharves, hold the cargoes until they

Eddystone lighthouse.

can be sent out to their destinations. No sooner is a ship emptied than the reloading begins, for shipowners do not like to have a ship waste time in the harbor. The more trips it makes the greater will be the financial returns.

Shipbuilding Materials. — To construct and maintain such a large merchant fleet requires an enormous amount of coal and iron. Fortunately England is bountifully supplied with both. For more than a hundred years Great



A British shipyard.

Britain stood at the head of all nations in their production. But recently Germany and the United States have been outstripping her. In 1910 she ranked next to the United States in coal production; and third in iron, being excelled only by our country and Germany. It is fortunate for Great Britain that wooden ships are disappearing, for her forests are not large, covering less than 5 per cent of the total area. In this respect she is far behind Germany and the United States. The factories, the ships, and the export trade have consumed so much coal in the last three centuries that the English fear the exhaustion of

their mines within the next one or two centuries. But for the present they have quite enough iron to maintain the largest commercial fleet on earth, and sufficient coal to steam their ships over the boundless seas. Her three greatest shipbuilding centers are well scattered over the United Kingdom. They are Glasgow on the Clyde River in Scotland, Newcastle on the Tyne in England, and Belfast in Ireland. By nature Great Britain is well equipped to lead in commerce.

Questions and Exercises

1. Find out all you can about Sir Francis Drake and other English explorers.

2. Locate on the map the two islands of the United Kingdom, North Sea, English Channel, France, Belgium, Netherlands, Denmark, Germany, the Rhine, Seine, Elbe, Spain, and Cadiz.

3. Make a collection of pictures of ships.

4. What are some of the difficulties that must be solved by engineers in building a tunnel under the English Channel?

5. Describe some of the work required in improving a harbor.

6. Why do British vessels carry so much of the merchandise of the United States?

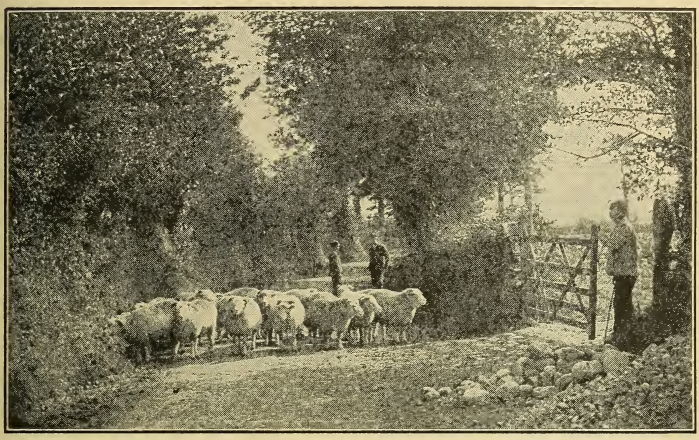
CHAPTER VI

ENGLAND, A LEADER IN THE WORLD'S INDUSTRY

Need of a Large Merchant Marine. — The United Kingdom is very small, compared with many other countries, and the population is very dense. In England, the most important country of the Kingdom, there are more than 500 people to the square mile, while the United States averages but about 31 to the square mile. Great Britain may be regarded as a gigantic workshop with millions of workers. Raw materials for the factories are brought on ships from all parts of the world, and the manufactured products are shipped from England to all other countries. This transportation of raw materials and finished articles requires a very large number of merchant ships. About three fourths of the people are engaged in manufacturing and commerce, while only a little more than one tenth are engaged in farming. Therefore the farms can supply only a small part of the food required by the total population; and so enormous quantities of food products must be carried in ships to this country. Merely to serve her domestic needs, England needs more ships than any other country. In addition most of the commerce between the several colonies of the British Empire, as well as much of the trade between foreign nations, is carried in British ships.

Agriculture. — In the British Isles farming is carried on with great care and skill. Every acre of farm land is cultivated in such a way as to produce the highest possible

yield of grain, root crops, or grass and hay. Only 17 per cent of the total surface is non-agricultural land. In the



An English farm scene.

mountainous sections of Wales, Scotland, and Ireland, there are extensive areas of grazing lands on which large numbers of cattle and sheep are raised. The leading crops are wheat, oats, barley, hay, potatoes, and turnips. Nearly all the wheat of the United Kingdom is raised in England. The English farmer has an enviable record as a producer of this grain. England yields 32.4 bushels per acre; Germany, 30.8; France, 19.0; Austria-Hungary, 18.4; United States, 14.3; Russia, 9.2. Oats, hay, and potatoes are the chief crops of Ireland and Scotland. Ireland also produces great quantities of flax. Truck gardening is carried on extensively in the densely settled sections.

Although the British Isles are in latitudes that are quite cold in most parts of the world, yet the warm westerly winds from the Atlantic give these islands a mild climate.

The frequent rains brought by these winds cause an abundant growth of grass and hay. The summers are too short and too cool and cloudy for corn and cotton to grow; in the northern portions, only hardy crops, like oats and potatoes, can be successfully grown. Although the summers are short, yet the long days partly compensate for the short growing season.

Because of the extensive grazing lands, large numbers of

live stock are raised. The British Isles are noted for the fine breeds of horses, cattle, and sheep that have been developed there. In the number of cattle per square mile, Ireland surpasses the other countries of the United Kingdom; while in the number of sheep per square mile, Wales is far ahead. Although many cattle, sheep, and hogs are raised, the supply of meat is not equal to the demand; therefore, heavy imports of this product are necessary.

History of English Agriculture.— In the early days of England agriculture was the chief occupation; but it was carried on in a way quite different from present methods. The farmers lived in villages surrounded by three kinds of land, (1) woodland, the common source of fuel for all the villagers, (2) meadows for pastures, and (3) arable land for farming. The tillable land was divided into small strips separated by narrow ribbons of unplowed land. Each farmer was assigned several strips lying in different sections so that all might receive equal shares of rich and poor soil. At first the same crops were raised year after year in the same fields. After a time the people learned that this wore out the soil very fast. Then the three field system was adopted. One year wheat or rye was raised on a given strip, the second year barley, oats, or peas were produced, and the third year the land lay fallow. This was the beginning of the farm practice known as rotation of crops.

During the fifteenth and sixteenth centuries the English farmers gave most of their attention to sheep raising instead of raising crops. At this time European countries across the Channel were rapidly developing the manufacturing of woolen goods, and there was a great demand for wool. The raising of sheep led to the inclosing of the fields and caused a great reduction in the number of farmers, for

this industry does not require nearly so many laborers as the growing of crops. So many farms were converted into sheep pastures that thousands of people were thrown out of employment. Many of them turned to the making of woolen cloth in their homes as a means of earning a living. During this time England produced so little grain that she had to import foodstuffs from other countries.

About the first of the seventeenth century England began to give less attention to sheep raising and more to the production of crops. In the middle of that century great improvements in agricultural methods became general. Marshes were drained and forests cleared in order to make more farming land, better methods of cultivation came into use, and new crops, such as turnips and clover, were introduced. Clover which enriches the soil for succeeding crops was used as a rotation crop. Instead of letting the land lie fallow for one year, clover was raised to increase fertility, and to supply feed for the farm animals. Through the eighteenth and nineteenth centuries methods of farming gradually improved until the scientific agriculture of the present day was reached.

Fisheries. — The shallow waters around the British Isles are among the best fishing grounds in the world. Here billions of cod, mackerel, haddock, and herring feed and spawn. Over 100,000 men secure annually from the sea more than 1,000,000 tons of fish valued at more than $54,000,000, a daily average of $150,000. The United Kingdom is the second greatest fishing country, being surpassed only by the United States. Fish is cheaper than meat because fishing grounds do not have to be bought, cannot be taxed, and require no cultivation. Every British coast town carries on fishing; but the most impor-

tant ports are Plymouth on the south; Yarmouth, Grimsby, Harwich, and Hull on the east; and Aberdeen in Scotland. Grimsby is said to be the greatest fishing port in the world. The fisheries contribute to England's ocean supremacy in two ways. The surplus product forms an important export, and fishing vessels are training schools for sailors who may later enter the merchant service.

Mineral Wealth. — Great Britain is one of the three most important coal and iron countries in the world. These minerals above all other resources have given her the position of leader among nations. Fortunately the coal and iron which are so necessary to each other, are found near together and not far from the sea, mostly in southern Scotland, northern England, and Wales. Ireland is not rich in these products.

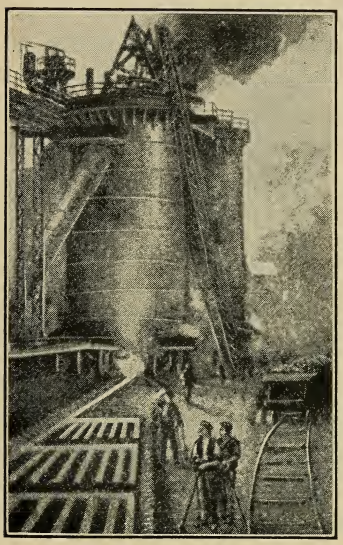
Iron. — While iron is abundant, so much has been used in the past, and the steel age is making such constantly increasing demands upon this metal, that the output is not sufficient to meet the demands of the factories. The country is compelled to import iron from Italy, Spain, and Sweden.

Coal. — Great Britain's chief coal deposits greatly exceed in value those of any other country in Europe.

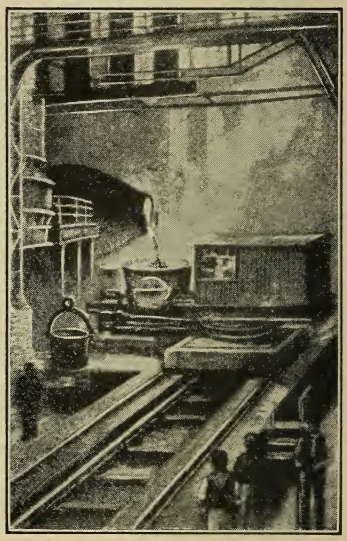
Some of the coal is used for fuel; about a third of it is exported; but most of it is used in the manufacture of cloth, the smelting of iron, and the manufacture of iron and steel products. For several reasons the British do not use nearly so much coal for fuel per capita as we do in our country. One reason is the mildness of winter. Another is that the English have trained themselves to feel comfortable at 60° or 65° Fahrenheit while we require 68° or 70°.

Coal and iron have had a great influence on the distribution of population in England. Long ago when agri-

culture was the chief occupation of the country, most of the population lived in the southern part. Few people lived on the moors and among the hills of the north, until



Blast furnaces.



Pouring molten steel into a ladle.

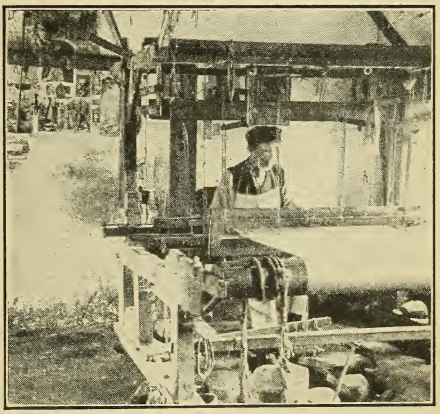
the beginning of the nineteenth century. After coal came into general use, manufacturing cities suddenly sprang up and the smokestacks of factories poured forth great black clouds over the once peaceful moorlands.

Manufacturing in Great Britain. — The extensive manufacturing of this country is due largely to the abundance of coal and iron, which are the two great natural resources upon which modern factories largely depend. However, the marvelous industrial prosperity of Great Britain is due not merely to nature's gift, but also in a large measure to the energy and intelligence of its people. The stamp of

the British craftsman is a guarantee of excellence and honesty. In skilled labor Great Britain and the United States take first honors. British manufactures cover a wide range of products, but the two most important are cloth, and iron and steel goods.

Textile Manufactures. — The making of cloth — cotton, woolens, and linens — is the most important branch of manufacturing. No other country surpasses England in the textile industry. English woolen cloth, especially used in men's and women's tailor-made suits, is renowned for its quality the world over. You have heard of tweeds, cheviots, and Scotch plaids? Most of the cloth centers are in the coal sections, between Liverpool and Glasgow. Leeds is noted for its woolen cloth, Leicester for its woolen hosiery, and Manchester is the greatest cotton-manufacturing center in the world. Belfast, Ireland, is an important center of linen manufacture.

Notable Inventions in England. — In the second half of the eighteenth century a number of inventions were made that caused marvelous changes in the textile industries. The invention of the flying shuttle in 1753 made the hand looms work so fast that the spinners could not meet the demands for thread. This was soon followed by



An early loom.

three improvements on the spinning machine. Arkwright invented the water frame in 1769 which enabled men to spin a stronger cotton thread. In 1770 Hargreaves brought out the spinning jenny which added to the rapidity of the work. In 1779 Crompton invented the "mule" which enabled men to manufacture fine muslin threads faster than ever. Then the spinners more than kept the weavers busy. In 1769 Watt invented the steam engine and in 1785 the power loom was substituted for the hand loom. These inventions were soon applied to the woolen and linen industries. Improvements were made also in spinning flax and combing wool, in dyeing and bleaching cloths, and in lace making and calico printing.

A Typical Manchester Factory Scene. — Manchester is world renowned for its many cotton mills, where spinning and weaving are carried on in huge factories many stories high. As the morning bell announces the opening hour of the day's work, throngs of men, women, boys, and girls move along the streets toward the mills. Some turn in at the warehouses; most of the men enter the tall spinning factories, while the women find their work in the low weaving sheds. In a few moments the operatives have removed their wraps and taken their stations at their various posts. The spinners watch their "mules" and frames; the weavers busy themselves with their looms. The rooms are filled with many driving wheels. On the stroke of the hour the machinery is set in motion. The leather bands fly on their endless journeys; frames move back and forth; cylinders revolve; spindles turn round and round; shuttles fly from side to side; looms work up and down. All this motion keeps spinners and weavers alert until the dinner time. Then the mill is deserted, and

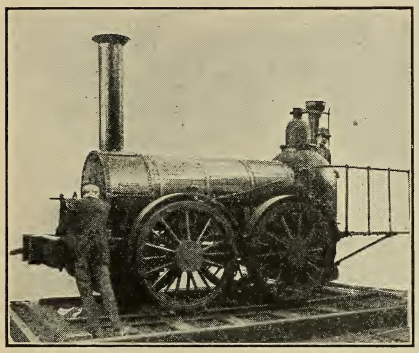
the street is again thronged with a lively, chattering crowd. After dinner the work is resumed until six o'clock, when the weary laborers leave the day's toil for the welcome, cheer, and rest of home.

Source of Raw Products. — Raw cotton is imported from India, Egypt, and the United States. Much of the flax for linen goods is grown in Ireland. The sheep pastures in far-away Australia and New Zealand furnish most of the raw wool; Great Britain furnishes the coal for power and most of the iron for the machinery of the textile mills.

Iron and Steel. — The making of iron and steel goods is the second greatest manufacturing industry in Great Britain. Only the United States excels England in this line of goods. The small island has at least thirty large manufacturing centers; among them London, the largest city in the world. As far back as the sixteenth century Birmingham has been making iron goods and metal wares, — knives, scissors, screws, skates; locks and steel springs; pins and pens; needles and nails; thimbles, buttons, and watch chains; cannon, steam engines, and machinery of all kinds. The world's best cutlery is made in Sheffield.

England's Leading Customers. — Textiles (cotton, linen, woolen, and other cloths) make up two fifths of the exports from Great Britain and Ireland; iron and steel manufactures make one fifth. The total export trade in 1912, a typical year, was about $2,450,000,000. A large part of England's trade is carried on with her colonies, with whom she keeps in close touch. Her principal foreign buyers in 1912 were Germany, United States, France, Russia, Argentina, Belgium, and Netherlands. The annual per capita exports amounted to $50, the imports to $60.

British Railways. — In 1825 George Stephenson invented the locomotive engine, to which he gave the significant name "The Rocket." His invention led to the building of the first railroad in 1830. This was the beginning of railroads in the world; and through them England not only increased her wealth immensely in the nineteenth century, but she gained a long start in advance of European nations in manufacturing and trade. Only recently have Germany and the United States caught up with her along these lines. Mr. Stephenson once said: "England made the railways, and in return the railways made England." He was right, for the commerce of the United Kingdom has been greatly promoted by the admirable system of more than 23,000 miles of railways reaching from every part of the interior to the seaports. England and Wales have the densest network of railways in the world. Every part of the island is within twelve hours of London by rail. Freight rates are higher than in the United States, but the railway beds and tracks are said to be the best in the world.



An early English locomotive.

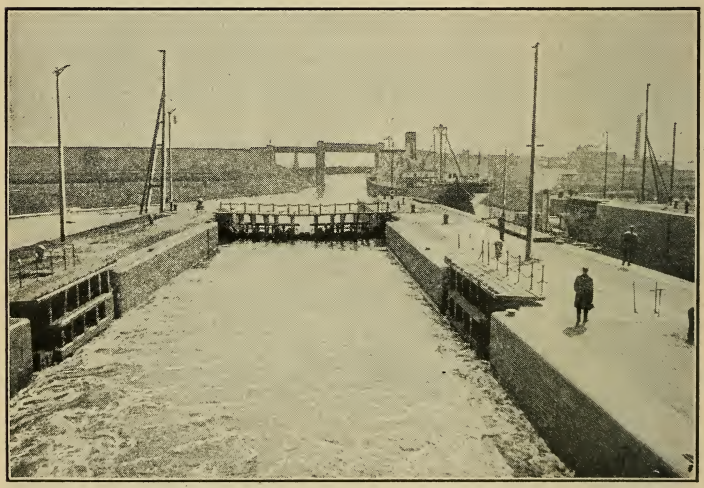
Rivers and Canals. — The many navigable rivers, with long, deep estuaries, reaching from the coast well into the heart of England, have greatly fostered commerce. Ninety-five per cent of the Thames, for example, is navigable. The usual British ingenuity has connected the streams by

means of canals, so that there is almost a perfect network of waterways as well as of railways. The first canal was built in 1761 by the private funds of the Duke of Bridgewater. Since then about 2,000 miles of public canals have aided commerce by affording complete internal water communications from coast to coast. The English have also made the rivers over again. Take the Tyne for example. Its bed has been deepened; its channel altered. Thousands of tons of earth have been removed from its bed so that large ships may float their heavy cargoes to Newcastle. The mightiest machinery in the world hoisted 51 million tons of dirt from the river, which was carried

An English railway train.

out three miles to sea. A dangerous promontory seventy-five feet high, obstructing navigation, was cut away. Docks were enlarged and thousands of feet of dry quays were built.

The Manchester Ship Canal. — For a long time, great unnecessary expense was added to the cotton manufacture of Manchester because the raw product which landed at Liverpool had to be reloaded there on trains for Manchester. Recently a ship canal thirty-five miles long and twenty-eight feet deep has been built between Manchester and the sea. This enables ocean ships to steam up to their docks, load and unload there, thus making Manchester a seaport, independent of Liverpool. This canal is one of the most wonderful conquests of man over nature.



Locks on the Manchester Ship Canal.

Country Roads.— Until the beginning of the nineteenth century very little attention was given to road-making in England, and the roads were poor. About that time Macadam and other engineers worked out many problems of road construction. Private companies and public author-

ities used the ideas of these men, and before the close of the century macadam roads extended over all parts of Great Britain. These highways of stone form the trade arteries between railroad centers and rural districts. The excellent roads bordered by beautiful hedges furnish one of the chief delights of travel in the rural sections of England.

The Ocean, the Only Means of International Trade. — In spite of her close network of railways and canals, England's only means of trading with other nations is by way of the oceans. The United States can send things by rail to Canada or Mexico. But not one country touches England. She stands alone in the midst of the waters. Every egg, every ounce of meat, every pound of sugar, every sack of flour, every apple that enters England from foreign lands has had a sea journey. Every yard of cloth, every garment, every pen, every pin that is sold to foreigners must be shipped across salt waters. No wonder, then, that Great Britain requires a large merchant marine.

Industrial Centers. — The manufacturing and commercial activities of Great Britain have caused the growth of many large cities within a small territory. It would require a large book to tell about all of them. We shall study only four.

London. — The capital, London, is the largest city in the world. It is the foremost banking center of the world, and one of its chief commercial ports. Including all its suburbs, it contains one fourth of the population of England. All roads in the entire Empire seem to lead to London. In spite of the fact that the Thames is not deep enough for the largest steamers, which dock twenty miles below the city, London was for a long time the world's greatest seaport. The early growth was due to the fact

A view of the wharves at London.

that the Thames River lies opposite some of the busiest rivers of Europe and the most highly developed countries. This made the city the collecting center of English exports and the distributing center of European and Asiatic imports. It handles more wool, tea, and wine than any other city and is one of the leading fur centers. Its colonial commerce is very heavy, especially with India. It was to further trade with that country that the Suez Canal was built. London's relative commercial rank is not so high as it once was. Large continental ports, like New York and Hamburg, excel it in the quantity of goods handled; but no other city requires for its personal use such large imports as London.

London has a population of over 7,000,000. It has inhabitants from all parts of the globe,—Frenchmen, Russians,

Germans, Italians, Americans, and many others,—enough of each to make a city. It is the busiest of busy cities. At all times great throngs of people crowd its chief business streets. Hundreds of thousands of persons from the suburbs enter the heart of the city each morning to earn a living in thousands of stores, factories, mills, and warehouses. The chief London streets and bridges are always crowded, as if a fair, or a parade, were going on. The people come on foot, and in omnibuses, electric cars, and underground railroads.

If you could look down from an airship upon London, you would be bewildered by the innumerable dwellings, the thousands of factories and warehouses, and the hundreds of ships in its harbors. At the London wharves, where there are miles and miles of landing places, many men are busy every day unloading cattle and sheep by the

Hyde Park, London.

thousands. The former come from Holland; the latter, from Australia. Shiploads of frozen beef are received from Argentina and Australia; many hundredweight of butter from Denmark; millions of poultry and eggs from France. Hundreds of barrels of apples arrive from Canada, and thousands of bales of cotton are received from the United States, India, and Egypt. Many fishing vessels bring in more than a million pounds of fish daily. Hundreds of casks of French and Italian wine are brought into London. Germany, France, Switzerland, and the United States ship to it great quantities of manufactured articles. Swedish timber and iron, Brazilian coffee and rubber are landed on London wharves. Arctic furs; tropical spices and fruits; grains, meat, and fruits of the temperate zone are unloaded in rapid succession. In short it takes all the world to feed, clothe, and shelter its largest city.

As soon as the ships are cleared of their cargoes, they are loaded with cloth, coal, machinery, cutlery, and implements, which go to all parts of the globe.

Liverpool. — Liverpool, on the Irish Sea, receives most of the American trade. It is the headquarters of the White Star and Cunard steamship lines. Liverpool is unrivaled as a distributing center. Near by, the large manufacturing centers of northern and middle England, the mining districts of Wales, and the Irish lowlands across the Irish Sea, look to Liverpool for food, clothing, and raw products.

Almost a third of the total trade of the country enters and leaves this port — exceeding 4,000,000 tons a year. New steamships are constantly being built for service between Liverpool and the other leading ports of the world. In 1914 the Cunard line added the *Aquitania* to

its number of magnificent ships sailing between New York and Liverpool. The tides that enter the Mersey River fill the harbor of Liverpool with sand and débris. To prevent this a wall 1300 feet long in the sea channel was finished November, 1910. It is hoped that this 237,000 tons of stone wall will secure for the harbor a deep-water entrance with no danger of future obstruction. This entrance is large enough for the largest ships now existing, or contemplated.

The Gladstone dock, 1020 feet long, accommodates the giant ships now in existence and will also admit the 1000-foot vessels of 60,000 tons of the future.

Liverpool Imports. — From 4,000,000 to 9,000,000 sacks of wheat annually have been imported of late into Liverpool from the United States, Russia, India, Australia, and Argentina. Ham and bacon are received in large quantities, principally from the United States, Ireland, and Denmark. Early in the twentieth century the prices of American meat rose so high that England reduced her purchases from us. Russia, Serbia, and China received the English pork trade which our country lost. Liverpool is the chief port for receiving American and Canadian apples. Sometimes a single shipment contains from 25,000 to 30,000 barrels of the fruit. More than a million cases of canned salmon found their way from our Pacific coast into Liverpool during 1910; but American butter and cheese are usually not wanted on account of the high prices. As a result Denmark, Sweden, New Zealand, Australia, and Canada have gained the lion's share of this trade.

Liverpool Exports. — A large part of the exports of Liverpool consist of woolen goods, made largely from raw material sent by Australia, New Zealand, and Argentina. The export and import trade of Liverpool, enormous as it

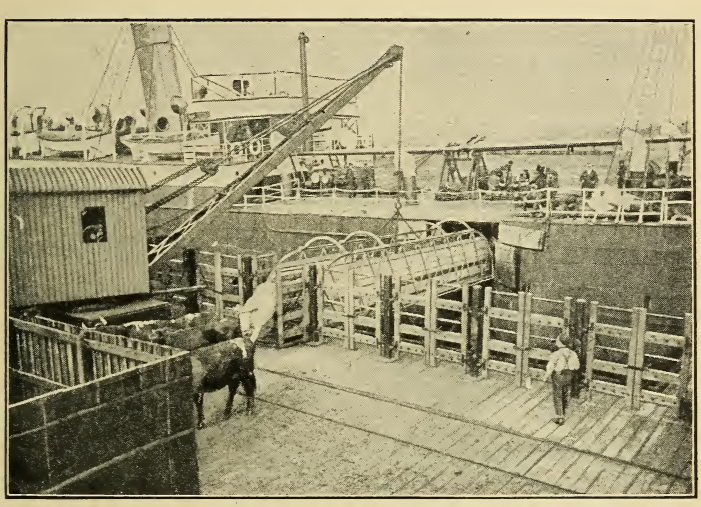
is, would be still greater if the Ship Canal connecting the Irish Sea with Manchester had not been built.

Manchester. — The trade relations of the United States with Manchester are as good as with Liverpool. The word "Manchester" has become almost a synonym for cotton manufacturing, and our country produces most of her necessary raw material. But while this is her leading business, cotton by no means exhausts her industries. Besides cotton goods, Manchester exports chemicals, dyestuffs, hats, handkerchiefs, thread, linens, velvets, steel wire, glass, china, and earthenware.

Fruit Sales. — Manchester ranks high in the importation of fruits. In 1910, 2,262,077 bunches of bananas were imported from the West Indies. Buyers from all parts of northern and middle England attend the public auction held on Tuesdays and Thursdays in the fruit salesrooms of Manchester. Here in normal times two and a half million dollars' worth of fruit changes owners annually. During three market days at Christmas time, 1910, there were sold 17,000 barrels and boxes of apples from the United States and Canada, 2150 boxes of Jaffa oranges, 22,250 cases of Valencia oranges, 7030 packages of Sicily grapes, and 195 barrels of Almeria grapes.

Display and Dispatching of Fruit. — The moment a ship is anchored at the docks, samples of its fruits are sent to the fruit salesroom. There they are displayed to prospective buyers, on elevators rising from the cellars. If a boat happens to land on a sale day the whole cargo may be sold in one or two hours. No sooner are sales made than forwarding orders are put into the hands of the representatives of the canals and railroads. Immediately these orders are sent to the docks. Not a moment is lost. Often

by the time the buyer leaves the salesrooms, his purchases have been loaded into freight cars and started toward their destination. Time is the great factor of a contract in the fruit market. The Manchester brokers, with the coöperation of the ship canal and railroad companies, manage their transactions with the greatest possible speed.



Unloading cattle, Manchester Ship Canal.

Port Facilities. — The long Manchester Ship Canal offers ample space to manufacturers for the erection of works along a waterway. In one large park estate of over a thousand acres, with a frontage of three miles on the canal, seventy-three firms have already secured space for carrying on production and trade on a colossal scale. The attention that is given to the best means of shipping each particular kind of goods is wonderful. For instance, molasses is imported in bulk. When the cargo arrives

from Cuba, it is pumped from the ship into large dock tanks and thence is distributed by motor tank wagons. Inflammable articles, like cotton, yarn, hemp, oil, are handled with the utmost care to reduce the fire risk.

Glasgow. — The United Kingdom builds more ships than any other country on earth. Every year large steamers are launched in the great shipyards of Belfast, Newcastle, and Glasgow. The last-named city is the leading shipbuilding center of the world. It is in the southwestern part of Scotland on the Clyde River, whose banks are lined with mighty ocean steamers in all stages of construction. The noise made by the thousands of hammers striking the steel almost deafens one. Both merchant vessels and powerful warships are made for England, and also for other countries.

Owing to an abundant supply of coal near by, Glasgow is a leading manufacturing center. The finest kinds of cotton goods and a great variety of heavy machinery are made.

Conclusion. — England began her industrial career as an agricultural nation. By and by she realized that there was great profit in manufacturing. The most important industries of England are the weaving of cotton and woolen goods and the making of iron and steel products. The importance of the textile industry is due largely to the early start given to it by the invention of improved looms and the machinery used in the manufacture of cloth. Rich mines of coal and iron near together have given England her high rank in the iron and steel industries. Most of the raw materials used in the English factories are brought from other countries and the many manufactured products are shipped to the four quarters of the globe. To

carry on this exchange of goods requires an enormous fleet of ships; so England is the greatest commercial nation of the world.

Questions and Exercises

1. Locate the chief manufacturing cities of Great Britain. Which are the leading centers of the textile industries? Which are the leading centers of the iron and steel industries?
2. Compare English and American agricultural methods.
3. Make as long a list of strictly English inventions as you can.
4. Take a trip to a harbor or freight depot. Describe the sights.
5. Collect pictures of docks, piers, and harbors.
6. Suppose that there were no such things as ships. What would be the industrial situation in England?
7. Does your community send any products to England?
8. What do you think is the greatest cause of England's prosperity?

CHAPTER VII

ENGLAND, THE FOUNDER OF THE WORLD'S GREATEST COLONIAL EMPIRE

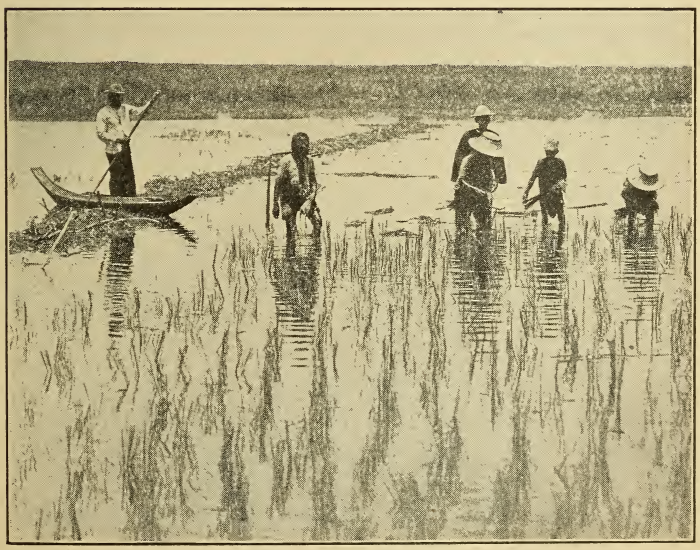
Extent of England's Colonial Possessions. — No other country is as rich in colonial possessions as Great Britain. Her colonies include Canada in North America, British Guiana in South America, British India in Asia, British East Africa, Union of South Africa, the whole of Australia, besides many islands and coaling stations. In addition she has control in Egypt.

Reasons for England's Colonial Ambition. — England's desire for colonial possessions is natural enough. Her population is constantly overflowing the limited area. Her ambitious young men seek careers which the home island cannot afford. The people are rich and demand larger opportunities for the investment of their money than can be found at home. Colonies afford the means for thousands of young people to develop into successful business men and leaders of state. England and her colonies, moreover, make an empire that is very largely self-sufficient and independent of other nations in products, industries, and commerce. She has sought the world over for resources and has found them. The British possessions are located in every zone, but most of them are in the Temperate belt. While Canada extends from the frozen Arctic in the north to the temperate parallel of 43° north latitude, British India stretches from 39° north latitude to within 8° of the equator. British East Africa is crossed by the equator. Australia and Tasmania lie

between 10° and 42° south latitude. The remotest southern English islands fringe the edge of the Antarctic Ocean. Thus British possessions extend from the most northern point of land on the globe to the southernmost.

British India. — The most precious jewel in Great Britain's crown is India, the middle peninsula of southern Asia. This country has an area half as large as the United States, with a population three times as great. It covers the same latitudes as the stretch of country between the Ohio River and the northernmost point of South America. Commercially India is the chief country in Asia.

Farm Products. — Most of the land consists of fertile plains, those in the north being watered by four large rivers — the Indus, Ganges, Brahmaputra, and Irrawaddy. More



Planting rice, India.

BRITISH INDIA
AND ADJACENT COUNTRIES
SCALE OF MILES
0 200 400 600 800 1000
L.L. FOATES CO., N.Y.
Longitude from Greenwich
CHINESE TURKESTAN
PERSIA
AFGHANISTAN
KABUL
Kandahar
Peshawar
Srinagar
KASHMIR
Amritsar
Lahore
Simla
KHELAT
BALUCHISTAN
DELHI
Meerut
Bareilly
Lucknow
Agra
RAJPUTANA
Hyderabad
Karachi
Cawnpore
Allahabad
Patna
Benares
Darjiling
ASSAM
Bhamo
Mandalay
UPPER BURMA
Rangoon
Bombay
Ahmadabad
Baroda
Surat
Daman (Port.)
Nagpur
Jaipur
Calcutta
Chandernagar (Fr.)
Hyderabad
Yanaon (Fr.)
GOA (Port.)
Madras
Bangalore
Mysore
Pondicherry (Fr.)
Mahe (Fr.)
Karikal (Fr.)
Tricumopoli
LACCADIVE IS.
MALDIVE IS.
CEYLON
COLOMBO
ANDAMAN IS.
NICOBAR IS.
Isthmus of Kraw
Bangkok
Pnum Penh
Saigon
Hue
Tonkin
Gulf of Tonkin
HAINAN
ARABIA
ARABIAN SEA
BAY OF BENGAL
SOKOTRA I.
MUSCAT
Ras-el-Had
Gulf of Ormus
PERSIAN GULF
Bushire
Kerman
Ispahan
Quetta
Khelat
Gwadur
Bela
Sutlej
Indus R.
Ganges
Narbada R.
Godavari R.
Irawadi R.
Brahmaputra R.
Yangtze Kiang R.
Yunnan
Chingtu
Lassa
Mt. Everest
Himalaya Mts.
Karakoram Mts.
Kuenlun Mts.
Hindu-Kush Mts.
Suleiman Mts.
Western Ghats
Eastern Ghats
Palks Str.
C. Comorin
Gulf of Manaar
C. of Martaban
Gulf of Siam
C. Cambodia
MALAY PENINSULA
SOUTH CHINA SEA
Mery
BOKHARA
RUSSIAN TURKESTAN
Khotan
Khiva
Herat
Kushk
Ispahan
Kerman
Bushire
Quetta
Sutlej
Simla
Meerut
Bareilly
Lucknow
Agra
Darjiling
Lassa
Chingtu
Yangtze Kiang R.
Yunnan
Bhamo
Mandalay
Irawadi R.
Brahmaputra R.
Ganges
Benares
Patna
Allahabad
Cawnpore
Hyderabad
Karachi
Ahmadabad
Baroda
Surat
Daman (Port.)
Nagpur
Jaipur
Bombay
Calcutta
Chandernagar (Fr.)
Narbada R.
Godavari R.
Hyderabad
Yanaon (Fr.)
GOA (Port.)
Madras
Bangalore
Mysore
Pondicherry (Fr.)
Mahe (Fr.)
Karikal (Fr.)
Tricumopoli
Palks Str.
C. Comorin
Gulf of Manaar
CEYLON
COLOMBO
LACCADIVE IS.
MALDIVE IS.
ANDAMAN IS.
NICOBAR IS.
Rangoon
Bangkok
Pnum Penh
Saigon
Hue
Tonkin
Gulf of Tonkin
HAINAN
Isthmus of Kraw
C. of Martaban
Gulf of Siam
C. Cambodia
MALAY PENINSULA
SOUTH CHINA SEA
ARABIA
ARABIAN SEA
BAY OF BENGAL
SOKOTRA I.
MUSCAT
Ras-el-Had
Gulf of Ormus
PERSIAN GULF
Bushire
Kerman
Ispahan
Quetta
Khelat
Gwadur
Bela
Sutlej
Indus R.
Ganges
Narbada R.
Godavari R.
Irawadi R.
Brahmaputra R.
Yangtze Kiang R.
Yunnan
Chingtu
Lassa
Mt. Everest
Himalaya Mts.
Karakoram Mts.
Kuenlun Mts.
Hindu-Kush Mts.
Suleiman Mts.
Western Ghats
Eastern Ghats
Palks Str.
C. Comorin
Gulf of Manaar
Khiva
Herat
Kushk
Mery
BOKHARA
RUSSIAN TURKESTAN
Khotan
50° 60° 70° 80° 90° 100°
30° 20° 10°

than half of the people are engaged in agriculture. Rice, wheat, millet, meat, sugar, and tea are the chief foodstuffs. In the number of cattle raised India leads all the other countries of the world. Formerly dry years caused crop failures, which resulted in famines. But since Great Britain has completed the admirable railway systems, foods can be easily shipped to the afflicted regions. Irrigation has also greatly reduced suffering due to scarcity of food.

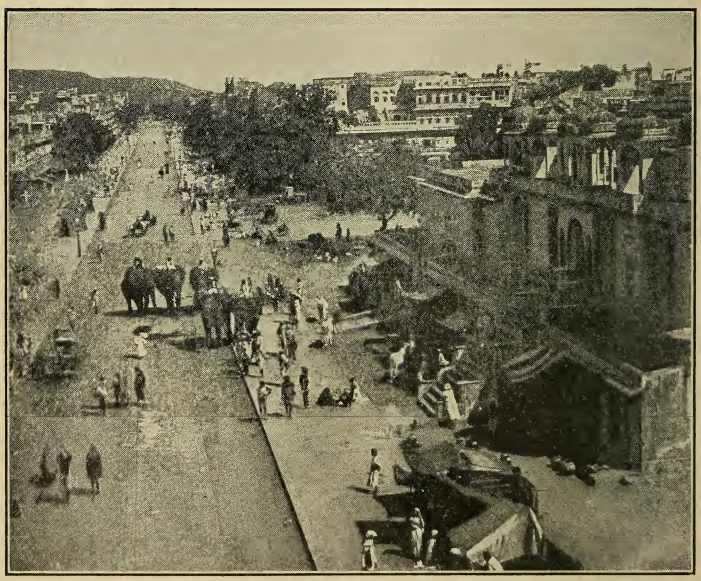
Silk culture is steadily increasing. The soil and climate are admirably adapted to the production of cotton. The mother country furnishes an excellent market for it, so it is not surprising that India produces more cotton than any other country, except the United States. By government regulation the production and use of opium are rapidly decreasing. The Ganges district has been called a great "hot-house." Besides the articles above mentioned, it produces indigo, opium, pepper, tobacco, cinnamon, nutmegs, coffee, and most of the world's jute.

Jute. — Jute is a tall plant grown for the fibers that are obtained from the stalks. After the fiber has been separated from the woody parts of the stems, it is baled and shipped, to be woven into cloth. The woven cloth is used mainly to make sacks and other covering for goods in shipment. Large amounts are used also in making carpets, rugs, and linoleum. Burlap is usually made from this fiber.

Manufacture and Commerce. — Formerly India was noted for its manufacture of carpets, silks, ornaments of gold, ivory, and precious stones made or shaped mostly by hand. Recently under English inspiration, modern factories have been established, in which machinery and metal wares, cotton and woolen goods, paper, oils, soaps,

and sugar are manufactured. Although iron and coal are abundant, the mines have not been developed as they have in England. Great Britain has covered India with a network of good wagon roads and railways. She has also constructed a fine telegraph system. Irrigating and commercial canals have been built, and harbors have been improved. These have greatly promoted industry, commerce, and human welfare.

The leading exports of India are raw jute and manufactures of jute, raw cotton and cotton goods, rice, oil seeds, wheat and flour, hides and skins, and tea. The chief imports are cotton cloth, hardware and cutlery, sugar, and machinery. About three fifths of the total imports come



A street scene in India.

from Great Britain, while only about one fourth of the exports go to that country. India has little commerce by land, for the Himalaya Mountains act as a barrier to northern trade, and so most of the commerce is by sea. Calcutta and Bombay are the leading seaports.

Australia. — Australia, a continent with an area equal almost to that of Europe, is Great Britain's second most important colony. While commerce and rich agricultural products attracted Englishmen to India, gold was one of the forces that drew them to Australia. In 1851 gold was discovered there and caused many thousands of Englishmen to emigrate to Australia. In a short time the Australian gold fields increased production, wealth, and trade in England. No industry profited more from the new gold fields than oceanic commerce. People were richer; they wanted more of the good things of life; more was consumed, and more was produced. This increased imports and exports.

Surface and Climate. — Mountain ranges lie near the eastern and southeastern coast of Australia, and the western part of the continent is a plateau, with a narrow coastal plain along the western side. The greater part of the interior of the country is a low plain. Most of the rain falls upon the outer side of the ranges and slopes that border the coastline, hence the interior is quite dry. Large areas of this section are deserts with a very scanty growth of grass and scrubs. As Australia lies in the south temperate zone, the summer months are December, January, and February.

Agriculture. — Owing to the extensive grazing lands, sheep raising is the chief occupation of Australia. The merino sheep give this country the largest, as well as the finest, wool clips in the world. Since it is now possible

AUSTRALIA AND TASMANIA
SCALE OF MILES
0 100 200 300 400 500
SUNDA IS.
TIMOR SEA
ARAFURA SEA
Torres Strait
NEW GUINEA
SOLOMON IS.
INDIAN OCEAN
CORAL SEA
PACIFIC OCEAN
TIMOR
BATHURST I.
MELVILLE I.
Port Darwin
Gulf of Carpentaria
GROOTE EYLANDT
C. York
LOUISADE ARCH.
C. Londonderry
Wyndham
C. Leveque
KIMBERLEY
Broome
Palmerston
CAPE YORK
Cooktown
Grassy Hill
Cairns
Barrier Reef
Townsville
Flinders R.
Charters Towers
NORTHERN TERRITORY
QUEENSLAND
Rockbourne
GREAT SANDY DESERT
Central Mt. Stewart
MacDonnel Ra.
Northwest C.
WESTERN AUSTRALIA
GIBSON DESERT
Musgrave Ra.
Rockhampton
Mary borough
Mt. Morgan
Sandy C.
Gympie
Moreton B.
BRISBANE
Toowoomba
TROPIC OF CAPRICORN
Barlee L.
Barrier Ra.
GREAT VICTORIA DESERT
SOUTH AUSTRALIA
L. Eyre
Northampton
Lake Torrens
Flinders Ra.
Darling R.
Broken Hill
Bathurst
Mitland
NEW SOUTH WALES
Newcastle
Parramatta
SYDNEY
Goulburn
Yass
Canberra
Albury
Mt. Kosciusko
C. Howe
MELBOURNE
Geelong
Port Phillip Bay
Bass Str.
FLINDERS I.
Launceston
TASMANIA
HOBART
Derwent R.
Great Australian Bight
Gulf of St. Vincent
KANGAROO I.
ADELAIDE
Encounter B.
Murray R.
Mt. Lofty
Ranges
Victoria L.
Ballarat
Geelong
Port Phillip
Bass Str.
FLINDERS I.
Launceston
TASMANIA
HOBART
Derwent R.
Mt. Kosciusko
C. Howe
MELBOURNE
SYDNEY
Newcastle
Goulburn
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Toowoomba
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Charters Towers
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Flinders R.
Barrier Reef
Cairns
Grassy Hill
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CAPE YORK
LOUISADE ARCH.
C. York
Torres Strait
NEW GUINEA
SOLOMON IS.
TIMOR
BATHURST I.
MELVILLE I.
Port Darwin
Gulf of Carpentaria
GROOTE EYLANDT
C. Londonderry
Wyndham
C. Leveque
KIMBERLEY
Broome
Palmerston
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GREAT SANDY DESERT
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NEW GUINEA
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GREAT VICTORIA DESERT
SOUTH AUSTRALIA
L. Eyre
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GIBSON DESERT
Rockbourne
GREAT SANDY DESERT
Central Mt. Stewart
MacDonnel Ra.
Northwest C.
WESTERN AUSTRALIA

to keep meat at a low temperature during transportation, the raising of cattle has become a growing industry. The freezing of meat for export is absolutely necessary because steamers from Australia must pass through the torrid zone on their way to England and other countries. Butter is another important product. In the sections where there is sufficient rain, field crops are cultivated. Wheat is by far the most important crop of the commonwealth.

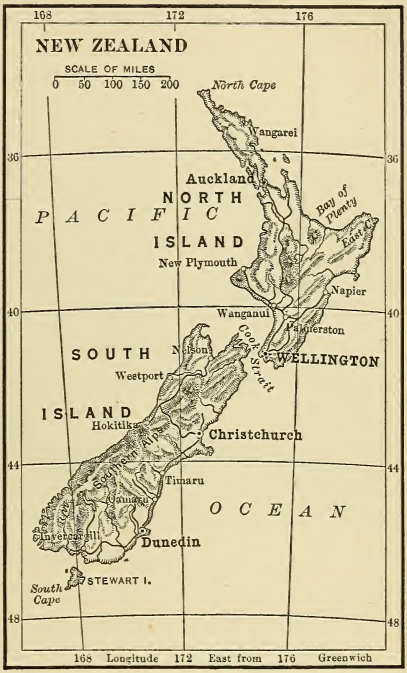
Sheep raising, Australia.

Minerals. — Australia is one of the world's leading producers of gold. There are also valuable deposits of silver, copper, coal, iron, tin, zinc, and lead. These minerals are of great commercial importance. Manufacturing has not yet been greatly developed.

Trade and Transportation. — The leading Australian exports are wool, gold, wheat, butter, skins and hides, beef, mutton, and tallow. The leading imports are iron and steel goods, cotton goods, clothing, and machinery. Most of the foreign trade is with Great Britain. Several steamship lines keep Australia in close touch with Europe and North America. The chief seaports of Australia are Sydney and Melbourne. Many railways have been laid in Australia. Among them is the coast road from Adelaide on the south by way of Melbourne and Sydney to Brisbane on the east. A transcontinental railroad between Port Augusta and Port Darwin is under construction; also one from Port Augusta to Perth. Nearly all the railways of Australia are owned by the government.

The Islands of New Zealand. — New Zealand, consisting of two large islands 1200 miles southeast of Australia, is

A view of Sydney, Australia.



one of the most thriving colonies of Great Britain. It is a fine example of successful colonization. Sturdy sons and daughters of England left the mother country to colonize these mountainous islands, where they have been wonderfully successful in both industry and government. The one million prosperous New Zealanders have in a short time put two thirds of the area of these islands under cultivation and export annually $100,000,000 worth of products. Auckland, Wellington, Christchurch, and Dunedin are the chief cities of New Zealand.

The chief industry is sheep raising. European countries are supplied with wool and mutton from millions of New Zealand sheep. Many cattle, too, are raised. Much beef and tallow, and many hides, are exported. Enormous quantities of butter and cheese are manufactured and shipped to markets 12,000 miles away. Wheat, flour, apples, and peaches are considerable exports. The chief imports are iron and steel manufactures, and cotton and

Dunedin, New Zealand.

linen goods. Most of the trade is carried on with England, Australia, and India.

Coal and gold are the leading minerals. Of the former not enough is mined for home use; but $5,000,000 worth of gold is exported annually. Manufacturing is in its infancy, because of the lack of coal, but there are good coal mines which when worked more extensively will stimulate industrial development. At present boots, shoes, woolen cloth, lumber, flour, and furniture are made and partly supply the demand of the islands. The making of spirituous liquors is prohibited.

It is claimed that New Zealand has one of the best governments in the world. Great freedom is allowed, and high standards of living prevail. Australia and New Zea-

land are sometimes called "the newest England in the southern seas."

Colonial Africa. — Africa consists very largely of European colonies, with boundaries not always definitely fixed. During the last twenty-five years of the nineteenth century, most of the continent with its uncivilized natives passed into the hands of European nations. At the dawn of the twentieth century, the larger and better portions were in the possession of England, France, and Germany. The reason that Africa was taken by these and other nations is that they needed greater outlet for their overflowing population and rapidly increasing trade. The reason that it could be so easily taken was that the savage tribes who occupied it were so far behind in civilization that up to the close of the nineteenth century this large, rich continent was still the least important of all the continents. Great Britain owns the most valuable sections.

British Colonies in South Africa. — The British colonies in South Africa include Bechuanaland, Rhodesia, Nyasaland, and the self-governing commonwealth known as the Union of South Africa. England's interest in Africa began with the Cape of Good Hope, the southern extremity of the continent. This point, before the Suez Canal was built in 1869, was an excellent port of call for British vessels on their way to and from India.

Union of South Africa. — This colony was formed in 1910 by the union of the following provinces: Cape of Good Hope, Natal, Transvaal, and Orange Free State. Most of the country consists of a plateau with scanty rainfall, but sufficient for grass. Along the southeastern coast there is abundant rain. On the grass lands of the interior the raising of sheep, goats, and cattle is the chief industry. Os-

ATLANTIC OCEAN
AUSTRIA-HUNGARY
FRANCE
SPAIN
ITALY
GREECE
TURKEY
RUSSIA
MEDITERRANEAN SEA
Str. of Gibraltar
MACEIRA IS.
CANARY IS.
Tangier
Algiers
Tunis
Atlas Mts.
Fez
Morocco
MOROCCO
ALGERIA
TRIPOLI
Tripoli
Port Said
Alexandria
Cairo
Suez
ARABIA
TUAT
TASILI
Murzuk
Libyan Desert
EGYPT
TROPIC OF CANCER
Rio de Oro
Igidi Desert
C. Blanco
SAHARA
TIBESTI
Timbuktu
St. Louis
UPPER SENEGAL AND NIGER
SENEGAMBIA
PORTUGUESE GUINEA
FRENCH GUINEA
Nubia
Khartum
KORDOFAN
DARFUR
Gondar
EGYPTIAN SUDAN
Gulf of Aden
Guardafui
SOMALI LAND
Adis Abeba
ABYSSINIA
Lake Tchad
BORNU
SOKOTO
NIGERIA
Kong Mts.
Bandama R.
IVORY COAST
GOLD COAST
Volta R.
Niger
Benue R.
Lagos
Porto Novo
Sierra Leone
Liberia
Monrovia
C. Palmas
UPPER GUINEA
GULF OF GUINEA
KAMERUN
Buea
Libreville
Congo R.
Stanley Falls
BRITISH EAST AFRICA
UGANDA
EQUATOR
Victoria N.
Mt. Kenia
Kilimanjaro
Mombasa
BELGIAN CONGO
Leopoldville
Boma
Loanda
GERMAN EAST AFRICA
Tanganyika L.
Zanzibar
Dar es Salaam
C. Lopez
LOWER GUINEA
ASCENSION I.
C. Delgado
C. Amber
ANGOLA
Benguela
Mossamedes
Nyassa L.
Zambesi R.
Mozambique
Channel
ST. HELENA I.
C. Frio
GERMAN SOUTHWEST AFRICA
Windhoek
Walfish Bay
Tananarivo
Beira
MADAGASCAR
TROPIC OF CAPRICORN
BECHUANALAND PROTECTORATE
TRANSVAAL
Johannesburg
Kimberley
ORANGE FREE STATE
Bloemfontein
Pietermaritzburg
Lourenco Marquez
Mozambique Channel
C. St. Mary
Orange R.
CAPE OF GOOD HOPE (CAPE COLONY)
Cape Town
C. of Good Hope
Port Elizabeth
INDIAN OCEAN
AFRICA
SCALE OF MILES
0 500 1000

trich farming is a profitable business and about 85 per cent of the world's supply of ostrich feathers comes from this region.

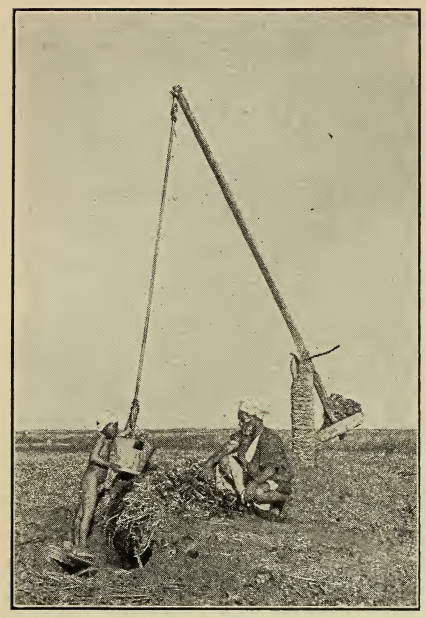
Gold and diamonds are the most valuable products of the Union. The diamond mines near Kimberley yield practically all the diamonds of the world's markets. The output of these mines is carefully regulated in order to prevent the overstocking of the market and the reduction of prices. Most of these precious stones are sent to London. The Transvaal gold fields are sources of enormous income and form the leading gold producing district of the world.

The chief exports of the Union of South Africa are gold, diamonds, wool and mohair, ostrich feathers, and hides and skins. The leading imports are food products, cotton cloth, clothing, iron and steel, and machinery.

Railway building is receiving much attention. A trunk line extends from Cape Town through Rhodesia, giving transportation facilities to the interior. England hopes to continue this railroad to the Mediterranean Sea. This is the Cape-to-Cairo railroad, which is being built from both ends toward the interior. When completed it will be very helpful in developing Africa.

British Colonies in Tropical Africa. — Riches of an entirely different character come from the British colonies in central Africa. This productive tropical region furnishes palm oil, gums, rubber, ebony, ivory, tropical nuts, and hides, in exchange for textiles, tobacco, firearms, beads, metal ware, trinkets, and preserved fruits.

Egypt. — While Egypt was a vassal of Turkey, England became the real governing power thirty years ago. England's claim to a controlling part in Egypt's financial affairs



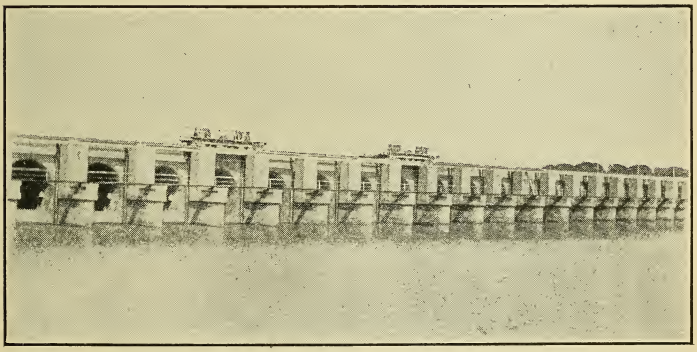
A primitive method of raising water for irrigation, Egypt.

lies partly in the fact that she owns the Suez Canal, which is a most important link in the shortest sea route between India and the mother country. Almost three fourths of the Canal trade is British. Under British supervision justice has been established and the people who have been oppressed for centuries now enjoy freedom and prosperity. Great irrigation works have been constructed and thousands of acres of desert lands reclaimed. Another evidence of British control is the Cape-to-Cairo railway, which England has constructed along the Nile River.

British Guiana. — England does not own much territory in South America. Her only colony there is British Guiana in the north, with an area a little larger than that of Great Britain. The tropical climate interferes with active industrial development in this country. Agriculture is not very important because of the small amount of rich soil, merely a narrow strip along the coast. Sugar and rice are the leading crops. The rough hilly interior is covered with virgin forest. There is great mineral

wealth, chiefly gold and diamonds. This country exports sugar, molasses, rum, timber, rice, gold, and diamonds. It imports flour, tobacco, fish, machinery, hardware, meat, butter, and potatoes. Most of the trade is with the mother country.

Canada. — The largest and most prosperous of all English possessions is the Dominion of Canada, lying just north of the United States. It covers an area forty-two times that of Great Britain. While Canada is a loyal daughter of the mother country, she has nearly absolute charge of her own affairs. England's power is represented by a Governor-general, appointed by the king. The laws are made by a Parliament which consists of a Senate appointed by the Governor, and a House of Commons elected by the people. The Canadian Parliament has almost as much power as the Congress of the United States. It is limited only in matters relating to foreign affairs. No



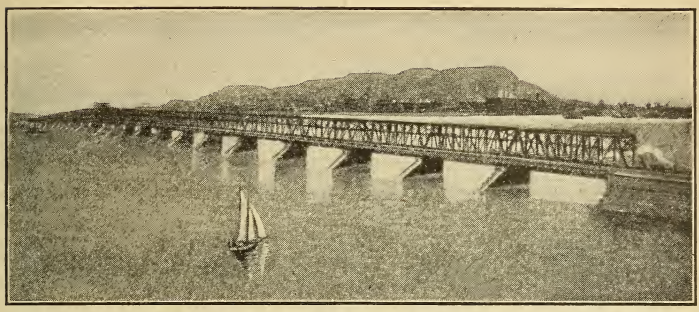
The Assuan Dam across the Nile. The water above the dam is diverted into irrigation canals.

British soldiers watch over Canada; its army is composed entirely of Canadians. This colony is not assessed for

even the smallest sum by England. In short, she has all the independence and privileges which we prize so highly in our country. Then what does England profit by this colony? Canada gives commercial preference to England. The duties levied by Canada on imports from the United Kingdom and other parts of the British Empire are much lower than those from foreign countries. In an industrial age this preferential tariff is a matter of great importance to Great Britain.

Area, Surface, and Climate. — Larger than the United States and Alaska together, Canada, lying between 43° and 70° north latitude, extends over nearly as many degrees as Europe. It is made up of immense plains in the east

Canadian Houses of Parliament, Ottawa.

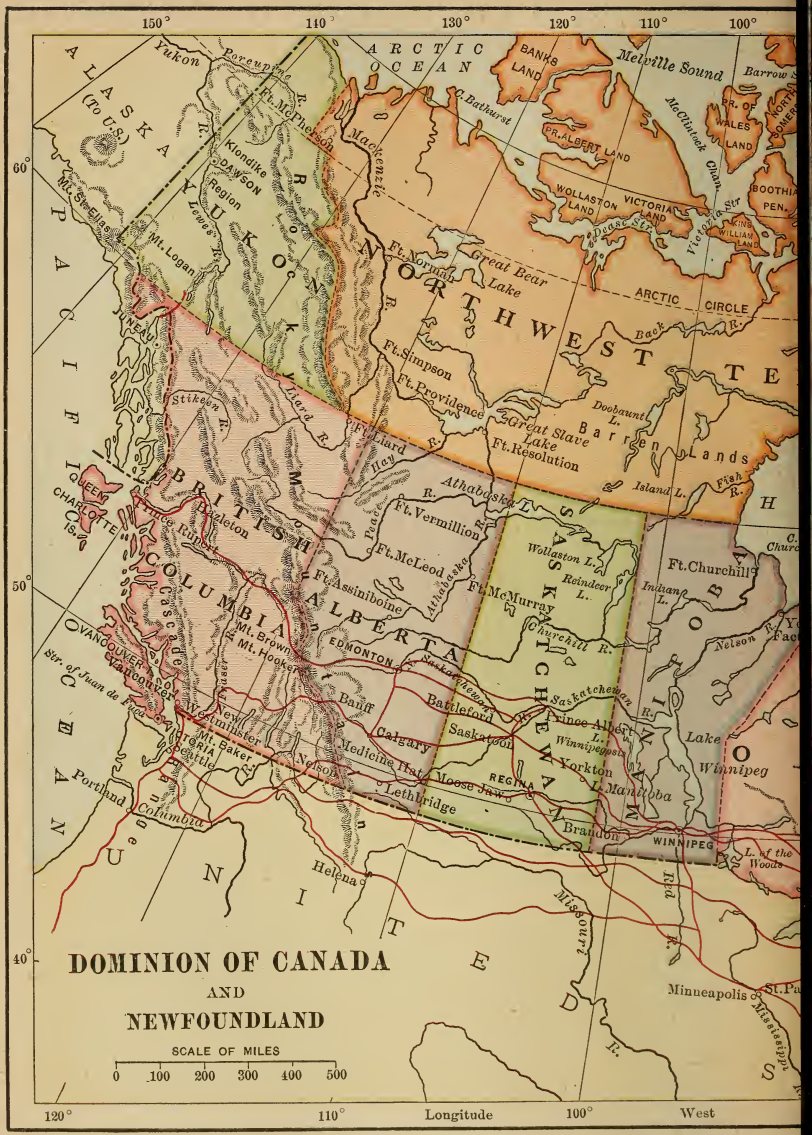


Bridge across the St. Lawrence at Montreal.

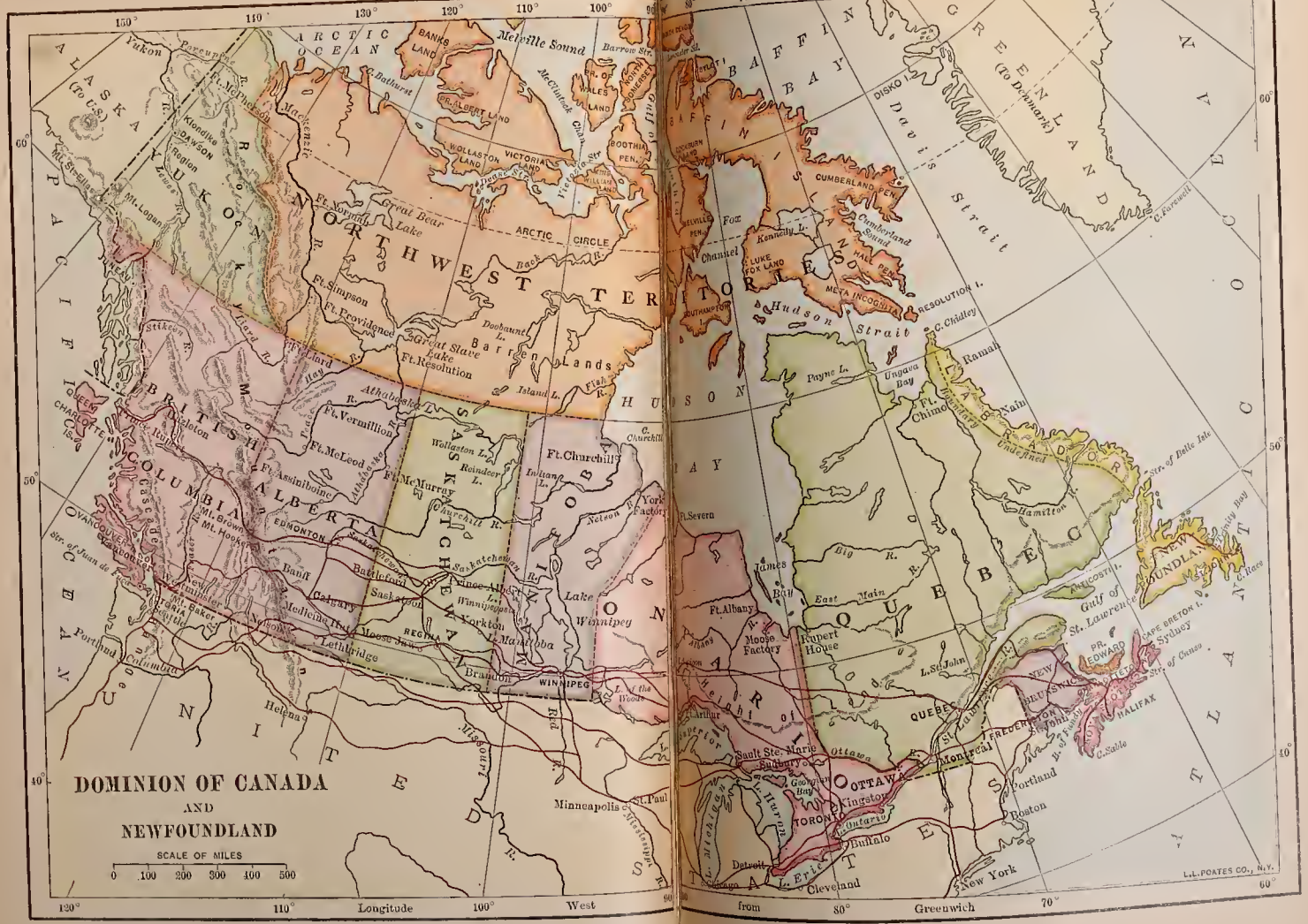
and central parts, and an extensive stretch of high plateaus and picturesque mountains in the west. While the extreme northern part and the adjacent ice-bound Arctic islands lie in the frigid zone, by far the larger part of the country is in the temperate belt.

Rivers and Lakes. — Almost the entire country has ample rainfall, so there are many rivers, well scattered over the territory. The best known inland waterways are the Yukon, Mackenzie, Saskatchewan, Nelson, and St. Lawrence. Nor is there a scarcity of lakes. Half of four of the Great Lakes on our northern boundary belong to Canada. Then there are Lake Winnipeg, Great Bear Lake, Great Slave Lake, besides scores of smaller ones.

Forests. — Canada ranks next to Russia and the United States in its timber resources. Just south of the Arctic circle is a belt of fir, spruce, pine, and hemlock, between 200 and 300 miles wide. The timber will be a great source of income as soon as means of transportation are pushed into this north land. Farther south are hard woods, such as elm, oak, beech, and maple. Hundreds of sawmills are


DOMINION OF CANADA
AND
NEWFOUNDLAND
SCALE OF MILES
0 100 200 300 400 500
ARCTIC OCEAN
ALASKA (To U.S.)
PACIFIC OCEAN
UNITED STATES
YUKON
NORTHWEST TE
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
Yukon
Porcupine R.
Ft. McPherson
Klondike
DAWSON
Region
Lewes R.
Mt. St. Elias
Mt. Logan
JUNEAU
Stikeen R.
Liard R.
Ft. Liard
Hay R.
Peace R.
Athabaska L.
Ft. Vermillion
Ft. McLeod
Ft. Assiniboine
Athabaska
Ft. McMurray
Churchill R.
Wollaston L.
Reindeer L.
Indian L.
Ft. Churchill
Nelson R.
Lake Winnipeg
Mackenzie
Ft. Norman
Great Bear Lake
Ft. Simpson
Ft. Providence
Great Slave Lake
Ft. Resolution
Doobaunt L.
Barren Lands
Island L.
Fish R.
Back R.
Melville Sound
Barrow S
C. Bathurst
BANKS LAND
PR. ALBERT LAND
PR. OF WALES LAND
McClintock Chan.
WOLLASTON LAND
VICTORIA LAND
Victoria Str.
KING WILLIAM LAND
BOOTHIA PEN.
Dease Str.
ARCTIC CIRCLE
QUEEN CHARLOTTE IS.
Prince Rupert
Bazleton
Cascade
Mt. Brown
Mt. Hooker
EDMONTON
Saskatchewan
Battleford
Saskatoon
Prince Albert
Winnipegosis
Yorkton
L. Manitoba
Brandon
WINNIPEG
L. of the Woods
Banff
Calgary
Medicine Hat
Moose Jaw
REGINA
Lethbridge
Nelson
Mt. Baker
Westminster
New Westminster
VICTORIA
Seattle
Portland
Columbia
Str. of Juan de Fuca
Helena
Missouri R.
Red R.
Minneapolis
Mississippi
Longitude
West
150°
140°
130°
120°
110°
100°
60°
50°
40°

80°
70°
60°
50°
40°
30°
60°
50°
40°
DEVON
BYLOT I.
BAFFIN BAY
GREENLAND
(To Denmark)
DISKO I.
Davis Strait
COCKBURN LAND
CUMBERLAND PEN.
MELVILLE PEN.
Fox Channel
Kennedy L.
Cumberland Sound
LUKE FOX LAND
HALL PEN.
META INCOGNITA
RESOLUTION I.
SOUTHAMPTON I.
Hudson Strait
C. Chidley
C. Farewell
Payne L.
Ungava Bay
Ramah
Ft. Chimo
Boundary
Nain
LABRADOR
Undefined
Str. of Belle Isle
Hamilton R.
Ft. Severn
James Bay
Big R.
East Main R.
QUEBEC
ANTICOSTI I.
NEW FOUNDLAND
Trinity Bay
ST. JOHNS
C. Race
Gulf of St. Lawrence
Ft. Albany
Moose Factory
Rupert House
L. St. John
PR. EDWARD
CAPE BRETON I.
Sydney
Str. of Canso
NEW BRUNSWICK
CHARLOTTETOWN
NOVA SCOTIA
HALIFAX
Height of Land
QUEBEC
St. Lawrence R.
FREDERICTON
St. John
B. of Fundy
C. Sable
Sault Ste. Marie
Sudbury
Ottawa R.
Montreal
Georgian Bay
OTTAWA
Portland
Kingston
TORONTO
L. Ontario
Boston
L. Huron
L. Michigan
Buffalo
Detroit
L. Erie
Chicago
Cleveland
New York
ATLANTIC OCEAN
L.L.POATES CO., N.Y.
from
80°
Greenwich
70°
60°


DOMINION OF CANADA
AND
NEWFOUNDLAND
SCALE OF MILES
0 100 200 300 400 500
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
BAFFIN BAY
Davis Strait
Hudson Strait
Hudson Bay
GREENLAND
(To Denmark)
ALASKA
(To U.S.)
YUKON
NORTHWEST TERRITORIES
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUEBEC
NEW BRUNSWICK
NOVA SCOTIA
PR. EDWARD I.
NEWFOUNDLAND
LABRADOR
BANKS LAND
PR. OF WALES LAND
PR. ALBERT LAND
WOLLASTON LAND
VICTORIA LAND
PRINCE PATRICK LAND
MELVILLE PEN.
BOOTHIA PEN.
CUMBERLAND PEN.
HALL PEN.
FOX CHANNEL
SOUTHAMPTON I.
RESOLUTION I.
CAPE BRETON I.
Melville Sound
Barrow Str.
McClintock Chan.
Lancaster Sd.
Jones Sd.
Smith Sd.
Kennedy L.
Cumberland Sound
Frobisher B.
C. Farewell
C. Chidley
Ramah
Nain
Hamilton R.
Str. of Belle Isle
Anticosti I.
Gulf of St. Lawrence
Str. of Canso
C. Race
Trinity Bay
C. Sable
Mackenzie R.
Great Bear Lake
ARCTIC CIRCLE
Great Slave Lake
Back R.
Doobaunt L.
Barren Lands
Ft. Norman
Ft. Simpson
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Island L.
Fish R.
Ft. Liard
Hay R.
Stikeen R.
Yukon R.
Pelly R.
Lewes R.
Klondike R.
Mt. McPherson
Mt. Logan
Mt. St. Elias
DAWSON
Yukon Territory
Athabasca R.
Athabasca L.
Ft. Vermilion
Ft. McLeod
Ft. Assiniboine
Peace R.
Wollaston L.
Reindeer L.
Ft. McMurray
Churchill R.
Ft. Churchill
Indian L.
Nelson R.
York Factory
C. Churchill
Ft. Severn
Winnipegosis L.
Lake Winnipeg
Manitoba L.
Lake of the Woods
Rainy L.
Rainy R.
Albany R.
Moose Factory
Rupert House
James Bay
East Main R.
Big R.
Payne L.
Ungava Bay
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Sault Ste. Marie
Sudbury
Georgian Bay
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QUEBEC
L. St. John
St. Lawrence R.
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Str. of Juan de Fuca
Vancouver I.
Victoria
New Westminster
Mt. Baker
Seattle
Tacoma
Nanaimo
Mt. Brown
Mt. Hooker
Yellowhead Pass
Kicking Horse Pass
Banff
Calgary
Edmonton
Medicine Hat
Lethbridge
Saskatoon
Battleford
Prince Albert
Yorkton
Moose Jaw
REGINA
Brandon
WINNIPEG
Qu'Appelle R.
Assiniboine R.
Souris R.
Red R.
Missouri R.
Saskatchewan R.
Winnipeg R.
Nelson R.
Churchill R.
Athabasca R.
Mackenzie R.
Peace R.
Liard R.
Pelly R.
Stikeen R.
Yukon R.
Lewes R.
Klondike R.
Mt. McPherson
Mt. Logan
Mt. St. Elias

A Canadian forest.

kept busy in these forests. In addition to the lumber the soft woods produce very valuable pulp for the manufacture of paper, which is sent to England and the United States. For a century lumbering has been a leading occupation.

Fur Trade. — The earliest industry of Canada, and for a long time practically the only one, was fur trading. The great subarctic forests were, and still are filled with the beaver, bear, marten, muskrat, mink, lynx, sable, otter, and the silver and black fox. Some of these valuable fur bearers are rapidly dying out. The Hudson Bay Fur-Trading Company has trapping stations all over the northern forests, along the waterways, which afford practically the only means of communication in summer. Dog sleds and snowshoes are used in winter. The Company has its office at Winnipeg. Canada is one of the world's largest fur producers. Most of the pelts are sent to London and the United States.

Fisheries. — The fisheries, ranking among the most important in the world, bring in large financial returns. On the Atlantic coast are found valuable fishing grounds, abounding in cod, halibut, herring, mackerel, haddock, oysters, and lobsters. The Great Lakes yield trout and whitefish. Salmon fishing is one of the most profitable occupations on the Pacific coast. Most of the fish exports go to England and the United States.

Minerals. — Our northern neighbor is almost as rich in variety and extent of minerals as is the United States. Gold, coal, silver, copper, iron, and nickel are abundant. Petroleum and gas are rather limited. The province of Quebec controls the world's market for asbestos. The Canadian coal fields exceed those of all Europe. Portland

cement, clay products, and limestone also are plentiful. The United States buys most of Canada's metals.

Farm Wealth. — The greatest source of wealth lies as yet in the products of the soil. Wheat, oats, hay, potatoes, barley, corn, turnips, and flax are the chief crops. West of Lake Winnipeg is one of the world's greatest granaries. Those wheat lands cover four times as many acres as the prairies in the Mississippi Valley. While it is very cold in winter, the summer days are hot and from fourteen to eighteen hours long. So much daily sunshine makes prime wheat. It has been predicted that before long Canada will furnish the British Isles with all their bread. Wheat ripens as far north as 56 degrees. That puts Minneapolis, which was formerly regarded as being near the northern limit of the wheat belt, in the middle of it.

Lately people of other countries — Germany, England, and even the United States — have migrated into Canada's wheat region. Most of them are energetic and intelligent; for great inducements are held out to such. Canada does not want shiftless, ignorant men, or paupers. While the immigration of worthy, reliable men into Canada is very profitable for her, it is unfortunate for our country to lose those who go from the United States to Canada.

Apples, peaches, plums, pears, and grapes are raised in eastern Canada. The mild climate of southern Ontario, due to the influence of the Great Lakes, makes this region the leading fruit section of the Dominion. Large fruit shipments, especially of apples, find their way to Manchester, Liverpool, and London.

Cattle, horses, sheep, and hogs are the leading farm animals of Canada. The number of cattle is far greater than that of any other kind of domestic animals. In the

A fruit farm, Canada.

grazing sections of western Canada cattle are raised merely for beef; in eastern Canada they are raised merely for dairy purposes. Ontario and Quebec are the leading dairy provinces, and butter and cheese are among their chief products.

Manufactures. — While factories are comparatively few in number, the unlimited supply of minerals, the abundant water power in the rivers, the vast lumber resources, and the rich farm products offer great incentives to manufacturing. Lumber, flour, iron and steel products, leather, butter and cheese, dressed meats, and clothing are the leading manufactured products. Raw materials, such as wool, rubber, cotton, and raw sugar, are imported and turned into manufactured products in the eastern cities, notably Montreal.

Transportation Facilities. — Canada is bountifully supplied with water routes, even though ice bound several months each year. She has great continental railroads, and valuable canals, especially along the St. Lawrence. The Yukon, Mackenzie, and Saskatchewan are magnificent commercial highways in summer time. The St. Lawrence system is one of the very best. Engineers have improved this river, deepening and widening it in many places, so that now it carries large vessels 2700 miles into the interior of the continent.

Railroads. — Canada is expending much energy and money in building railroads. The Canadian Pacific Railroad connects St. John on the Atlantic with Vancouver on the Pacific. Owning several steamship lines on both oceans, it has complete control of the shortest route from London to Yokohama. This railway has brought Montreal and Yokohama within eighteen days of each other. A

Canadian Pacific Railway Station, Winnipeg, Canada.

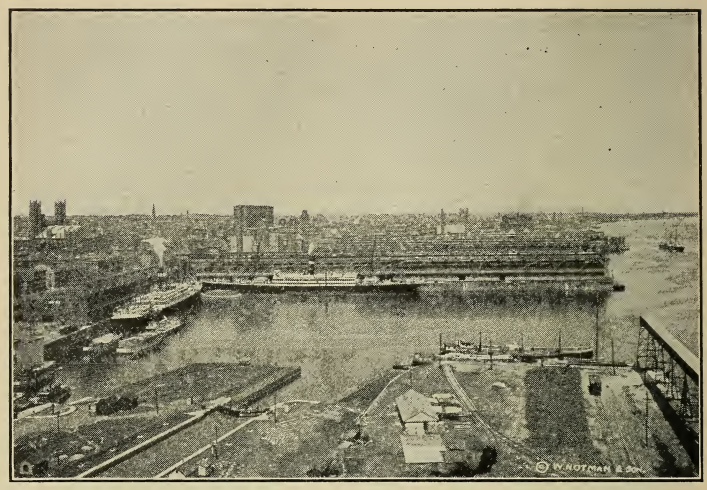
new transcontinental line, the Grand Trunk Pacific, has recently been constructed. It connects Halifax on the Atlantic with Prince Rupert on the Pacific, by way of Quebec, Winnipeg, and Edmonton. It passes through rich agricultural, forest, and mineral lands, and with the steamships of the company forms a second short route from Great Britain to Japan. The Canadian Northern is a third transcontinental railroad.

Another railroad is contemplated from Winnipeg to Hudson Bay, giving a shorter outlet for the wheat. Since Hudson Bay is open for commerce only three and a half months each year, the wheat shipment would have to be very heavy to make such a road profitable.

As the trade between Canada and the United States is very active, many railways have been built connecting the two countries. Some of them lead to seaports on the Atlantic coast of the United States, thus providing ice-free winter outlets for Canadian trade.

Cables. — Several cables owned by private companies connect Canada with England across the Atlantic. An all-British cable joins Canada and Australia across the Pacific.

Cities. — Ottawa is the capital of Canada. Toronto and Hamilton are important cities on Lake Ontario. Although a thousand miles from the sea, Montreal is the chief seaport of Canada. Engineers have made it possible for ocean steamers to come up to this inland city on the St. Lawrence. It is three hundred miles nearer England than New York is. Quebec is a manufacturing center. The fact that it is the summer port for the Grand Trunk Pacific railroad will increase its commercial importance. Halifax and St. John have the only ice-free harbors of eastern Canada.



Docks at Montreal.

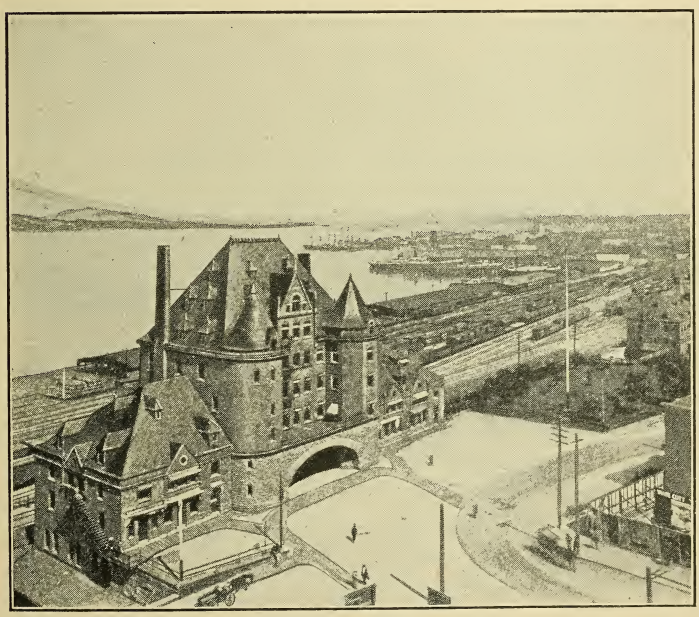
Winnipeg, on the edge of the prairies, is the greatest distributing center of the interior. Edmonton is a meeting place for hunters and trappers, and the headquarters for hunters' and trappers' supplies. Vancouver is the chief Pacific port. Steamers sail between Vancouver and Japan, China, and Australia.

The exports of this great agricultural country are wood products, wheat, cheese, silver, flour, bacon, and other commodities. Its imports consist of manufactured goods. England needs the foods, and is glad to sell to the Canadians cloths, iron and steel goods, and other factory products.

Canada and the United States. — The United States is in closer touch with Canada than with any other country, for the two border on each other for 3000 miles. Both have equal rights to four of the greatest lakes in the world. The people in both countries speak the English language.

Canada and the United States vary enough in their products to foster an excellent trade relation. The one is chiefly an agricultural country and therefore has foodstuffs to sell; the other is rapidly becoming a manufacturing nation and could exchange factory products for food. We need Canada's metal ores. Our forest supply is nearing exhaustion. We are fortunate in that the well-stocked Canadian forests are near by. Canada receives most of her imports from the United States. The relations between the two nations are most cordial.

Newfoundland. — Newfoundland, an English island off the coast of British North America, but in no way con-



View of Vancouver and harbor.

nected with the government of Canada, is noted chiefly for its fisheries. Codfish, iron and copper ores, cod-liver oil, sealskins, and canned lobsters are exported.

Coaling Stations. — In order to protect these large, widely scattered colonies, Great Britain has secured a number of small islands and towns that encircle the earth and form excellent landing and coaling stations for ships in their journeys from colony to colony. Though small, these are no mean possessions, as they help to secure England's supremacy of the sea: At the west entrance of the Mediterranean she owns Gibraltar, the southern

Gibraltar.

point of Spain; midway across the sea, the island of Malta; at its eastern end the island of Cyprus. Her control of Egypt secures her undisputed sway in the Suez Canal.

Where the Red Sea and the Indian Ocean meet, England owns Aden in southwestern Arabia, also a small adjoining island. The island of Ceylon, south of British India, and the port of Singapore at the southern extremity

of the Malay peninsula are other English stepping stones in the Indian Ocean.

The island of Hong Kong on the east coast of China is very helpful in getting Chinese trade and watching affairs in eastern Asia. Many of the swarms of small islands in the Pacific, east and southeast of Australia, also belong to England.

The Bermudas are a group of small islands in the Atlantic Ocean, about 600 miles east of North Carolina. The Bahamas, Jamaica, and Trinidad are some of the most important British islands of the West Indies. In the South Atlantic are the Falkland Islands and South Georgia. Near Africa, between the Equator and 20° south latitude, are St. Helena and Ascension Island.

A Widely Scattered Empire. — The area of Great Britain's colonies and island possessions is more than ninety times that of the British Isles. About nine tenths of the British subjects live outside the British Isles. The mother country is very helpful and liberal to her colonies. Wherever England plants her flag, law, order, and progress soon prevail. Because of the freedom they enjoy, British subjects in all parts of the world are loyal to the Empire.

Questions and Exercises

1. Follow the courses of the various steamship lines between England's ports and her chief colonial seaports. What exports do they take to the colonies? What imports do they bring back?

2. In what ways is Great Britain helpful to the United States? How does the United States help Great Britain?

3. What kind of government has Australia? In what ways is it like that of our country?

4. Find out how England acquired her colonies. Which of them all is of the greatest value to her?

5. Collect pictures of views in the various English colonies. Mount them by countries on separate cardboards.

6. Which is more valuable to England: India or the Suez Canal?

7. Make a comparative tabulated schedule of the chief products of England's colonies.

8. Make a tabulated schedule of Great Britain's interests in the Indian Ocean; in the Mediterranean; in the Atlantic; in the Pacific.

9. What good services has England rendered Australia? India? Egypt?

10. Show how the size and wealth of an empire depends on the happiness of the subjects.

CHAPTER VIII

POLITICAL AND SOCIAL CONDITIONS IN THE UNITED KINGDOM

Government. — While the head of the English government is a king or queen, yet the government is really a republic, for the people govern themselves as we do in the United States. The legislative department consists of Parliament, which is made up of the House of Lords and the House of Commons. The Lords hold their positions for life, while members of the House of Commons are elected by the people. The term of office of the members of the House of Commons may end at any time that the people wish to be represented by other men. The real governing power of the British nation is the English cabinet and the

Houses of Parliament, London.

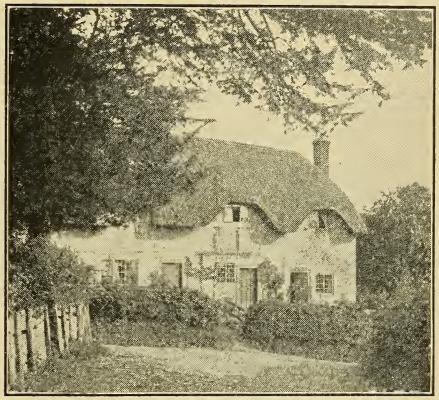
House of Commons. Nearly all bills are introduced by the Cabinet officers, for each is a member either of the House of Commons or of the Lords. The House of Lords has much less power than the Senate of the United States, for it cannot defeat legislation; it can only delay its passage. The English sovereign has less power than our President. He cannot veto a bill as the President has a right to do. While the English ruler has few constitutional powers, yet because of the feeling of loyalty and respect that the British people have for their sovereign, he has great influence in the social and political affairs of the nation.

Suffrage. — In the United Kingdom nearly all male citizens of legal age have the right to vote. Years ago only property owners could vote, but now the right of suffrage belongs not only to owners of property, but also to those who rent land or houses. Owners of property in different localities have the right to vote in each of these localities. Many English women are demanding suffrage, and they expect that this right will soon be granted them.

Home of a wealthy landowner.

Large Estates. — Although there are many small landowners in the United Kingdom most of the land is held by a few very wealthy landowners, and is farmed by tenants. Laws carefully guard the rights of the tenants and it is quite usual for a farm to be rented by several generations of one family.

An English Estate. — Let us visit an English estate. The castle or modern mansion in which the landlord lives is surrounded by a beautiful park, laid out by landscape gardeners, with smooth drives shaded by rows of magnificent trees. Elsewhere, cultivated shrubbery and flower beds charm the eye. A little farther off, upon a hillside, stands a native forest, with its crooked paths and a pretty little stream — here gurgling in the sunshine, there flowing deep and still at the feet of ancient trees. This is an ideal spot for the hunter and the fisherman. On the estate live a colony of people whose business it is to beautify the grounds and keep the property in repair. Foresters care for the trees; carpenters repair and build fences and farm buildings; gardeners cultivate vegetables and fruits; and other laborers trim hedges, build macadamized roads, and construct stone walls.



An English cottage.

At one edge of the park is a thriving town of several

thousand inhabitants, mostly tenants of the lord. On the estate are many fertile farms rented to tenants. There is a great difference between English farm life of to-day and that of a hundred years ago. Better methods and improved machinery have increased returns and decreased drudgery, so that farm life in England, as in America, is less dull and monotonous. The farmers are more intelligent and prosperous than formerly, and therefore happier and more hopeful.

Besides the large home estate, the landlord may own houses and lands in London or Liverpool, rich mines, busy factories, and great harbors. An English landlord is usually not a man of leisure. Much of his time is spent in examining the reports and directing the activities of agents who look after the details of his business affairs. In short, the work of an English landlord is much like the management of a small kingdom and quite as difficult.

Condition of Factory Workers. — Factories brought in many undesirable conditions. They were generally overheated and poorly ventilated. Many women and young children were employed because they would work for less than men. The hours of labor were too long; and the close indoor work was unhealthful. The children remained uneducated, and they were often injured by machinery and mistreated by the overseers. Parents were frequently as careless of the welfare of their children as the employers were. They kept them from school so that their earnings might bring a little more money into the family treasury. Because of insufficient pay, the working classes lived in poverty and dirt; food was poor and scant; and the death rate was very high, which was due largely to frequent epidemics. After some years Parliament

provided for better conditions. New factory laws were passed. Night work was prohibited, working hours reduced, better ventilation of factories secured, and provision was made for educating factory children. About 1850 a Saturday half-holiday was granted.

The well-being of the workers, due to individual and government efforts, has steadily advanced. The sanitary conditions in factories have been greatly improved, and the working hours repeatedly shortened. The compulsory education law has from time to time raised the age limit at which children may leave school. The laborer has risen in the social scale. In the gloomy days of the past the laws seemed to be against him. To-day his vote gives him more and more control of living conditions. In no country does the laboring class have a greater voice in legislation than in the United Kingdom. Parliament has done much for the laborer and his family.

Old-age Pensions and National Insurance. — In 1908 Parliament passed a law granting a small pension to every person over seventy years old whose annual income is less than $165, provided he has not been an idler or a criminal, and is not receiving relief from some private source. In 1911 the National Insurance Act was passed. This law provides for medical attendance and the payment of money to persons in time of sickness. It also provides in certain specified trades the payment of money in case of unemployment. The money comes from assessments made upon workers during periods of health and employment, from assessments levied upon employers, and also from government funds. The aim of these laws is the prevention of poverty in case of illness, unemployment, or old age.

The Navy and Army. — In order to protect her commerce and the widely scattered countries of the Empire, England maintains the largest navy in the world. The navy calls for thousands of men and an enormous outlay of money. In normal times the British army is small and is scattered among all parts of the Empire to maintain peace. The army kept in the United Kingdom is quite small. Great Britain has not been invaded by an enemy for eight and a half centuries, and since the country is an island, it relies upon the navy for protection and does not need a large army.

(c) *Underwood & Underwood.*
British troops passing Westminster Abbey.

Education. — England has long given much attention to the education of the upper classes. Her leading universities, Oxford and Cambridge, are among the best in the world. For a long time Great Britain gave little thought to public elementary education, but to-day the elementary schools are receiving special attention. The British high schools give thorough training in secondary

education. The increased educational advantages are producing finer citizens year by year.

Noted Men and Women. — England has produced a larger number of noted men than any other country. A few may be mentioned here. Shakespeare is the greatest writer of plays. Tennyson has written beautiful poems. Bacon is a great philosopher. No finer statesman than Gladstone ever lived. Stanley and Livingstone were great explorers. Darwin, Huxley, Harvey, and Newton are among the world's greatest scientists. James Stuart Mill is only one of many learned economists. Among England's noted women are Queen Victoria and Queen Elizabeth; Florence Nightingale, the nurse; and Elizabeth Barrett Browning, the poet.

Conclusion. — England, the mother country of the largest and most widely scattered empire on the globe, deserves our admiration for her industrial and colonial supremacy. We may well rejoice that our country was colonized and founded by such a progressive nation. We may be glad that so many Americans have an English ancestry. The English language is spoken by more people than any other. Our English inheritance in law, customs, language, and literature plays no small part in the success of our own country.

Questions and Exercises

1. Compare Parliament and the American Congress.
2. Who is the present British sovereign?
3. Describe an English country estate.
4. Find out all you can about the Rhodes Scholarships.
5. Why is it desirable for England and the United States to be on friendly terms?

What factors
have contributed to Germany's
industrial rise from sluggishness and
poverty to a high place among
the great nations?

THE GERMAN EMPIRE

CHAPTER IX

HOW GERMANY CAST OFF SERFDOM AND POVERTY

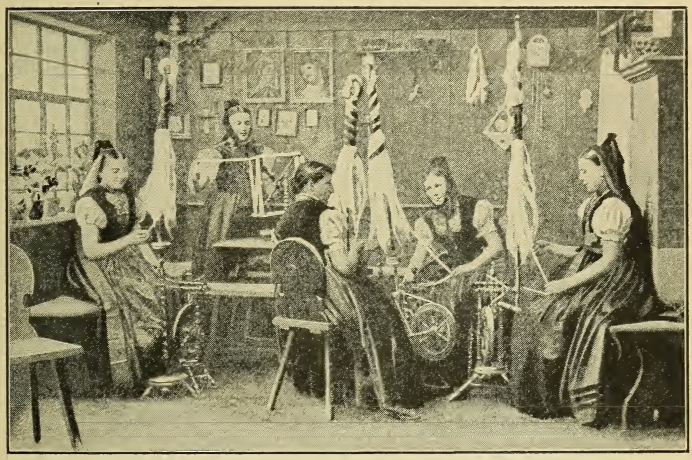
The Early Part of the Nineteenth Century. — During the first fifty years of the nineteenth century, while England was enjoying her industrial and commercial supremacy, Germany was suffering from serfdom and poverty. It consisted of a number of small states or provinces, which were loosely united in a Confederation. Many wars had been fought with neighboring countries, and also many wars between different German states. The state treasuries were empty; the upper classes had lost their wealth; and the common people had few rights except to pay taxes and be soldiers. When war broke out, they gave their lives for their country, because they were compelled to do so. Their patriotism was not very great and their services were not cheerfully rendered. Why should they love their country? It could not do much for them. No wonder then that thousands of Germans fled to the United States. Those who remained behind made a living as best they could. Many of them longed to be with their

cousins beyond the sea. If at that time the Atlantic could have been crossed in six days instead of six long weary weeks doubtless many more of the people of Germany would have flocked into our country. The expense of the trip, however, kept most of them at home. Let us consider some of the causes that brought about this deplorable condition.

Lack of Union among the States. — As has been said, there was no real union among the many small provinces, of which at one time there were a hundred and eighty bound to each other merely as a loose Confederation, with few common interests and no great common cause. And what was still worse they were exceedingly jealous of one another. Petty, selfish motives controlled both princes and people. The lords supervised all the industries closely. Scarcely an article was produced without the consent of the rulers, who often behaved as if they thought the country existed solely for their benefit.

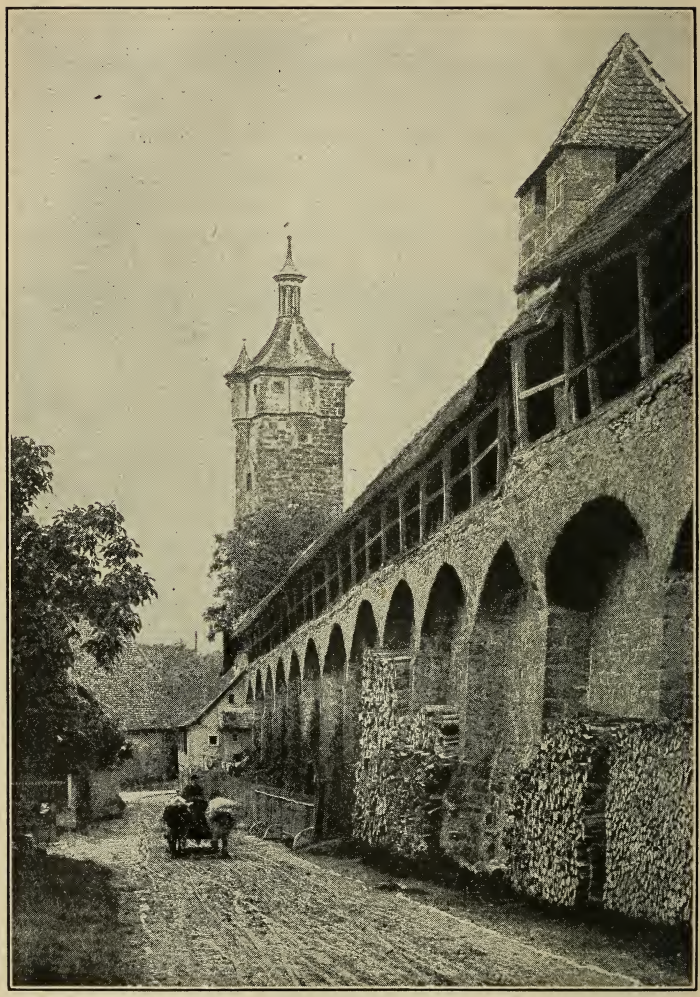
Farming in olden times.

Primitive Rural Conditions. — At the opening of the century the population was largely rural. In the west there were small peasant holdings. The prevailing poverty prevented progressive methods of agriculture. Coöperation and division of labor were practically unknown. Each family had to be self-sufficient; that is, it had to produce all its necessities of food, clothing, and shelter. The father, mother, and all the children worked at the common task



Peasant women spinning and weaving.

of making a living. Every family was its own planter, harvester, miller, and baker. It raised and butchered its own stock; cured and smoked its own meat. It was its own mason, carpenter, and repairer. Together the members of the family planted, reaped, and spun the flax. Then they wove the thread into linen, dyed the cloth, and made the garments. They brewed their drinks, and made by hand their soap and candles. No high degree of skill



Medieval city wall, Rothenberg.

could be produced under such circumstances. The best thing about all this was that the people, young and old, learned how to work and to cling to a task until it was done.

Landed Estates. — In the eastern provinces large estates were held by incompetent landlords. To each of them belonged a community of laborers, who were in effect merely serfs. Each of the peasants at first owned a small tract of land. He was compelled to surrender a part of all harvests to his lord, besides giving him a certain number of days' labor each year free of charge. Heavy taxes were exacted of the bondmen. Their burdens became more and more irksome until at last the master owned everything. The serfs had no personal liberty. They could not hire themselves out as they pleased, for they belonged to the estate. They could not marry whom they pleased without the consent of the lord. Their children also were chattels. Permission to study or learn a trade had to be obtained from the master, who had the further right to apply corporal punishment whenever he deemed it necessary. By and by men began to realize the awful injustice of such conditions. One by one the provinces put an end to this serfdom. By 1816 all German serfs had become freemen. That was a great step toward promoting industrial welfare.

Town Life. — About a fourth of the population lived in towns, but in many of them half of the people were engaged in farming or stock raising. There were few cities in those days, and a town of 10,000 was considered very large. In 1800 there were fewer towns with 10,000 inhabitants than there were cities of 100,000 in 1900. Factories were entirely unknown, but the laborers devoted themselves to specific occupations. Some spent all their time spinning or weaving in their own houses. Many men followed a

given trade; as baking, butchering, or tailoring. They did not hire themselves out to one man, but went about, upon call, from house to house; just as physicians and painters do now in our country.

The Effect of War upon Germany. — For centuries war was a common occupation in Europe. Germany, situated in the heart of the continent, often became the common battle ground even when she did not have a conflict of her own. That meant serious loss. Crops were destroyed, homes were burned, animals were stolen, and strong robust young men were killed, or maimed so as to become unfit for successful industry. War, too, always plunged the people deeper and deeper into debt. So there was very little capital to put into industry and when, about the middle of the nineteenth century, manufacturing began to be developed, Germany had to borrow vast sums of money, at a high rate of interest, from other nations, mostly from Belgium and England. At the same time Holland could borrow all she wanted at from 3 to 6 per cent, because she had a better industrial standing among nations than Germany.

Duties on Interstate Trade. — It is almost impossible to believe that the German states levied customs duties on products carried from state to state, from city to city, and even from the country into the towns. But it is true, because each small community wanted to protect its own industries and to force its people to produce all that their markets called for, no matter how little fitted for it they might be. This meant waste of energy and high cost of living. Little by little certain provinces entered into compacts with one another to remove the tariff on goods that they exchanged. By 1818 a tariff union was formed, assur-

ing free trade among eighteen states. Then goods began to move freely from one to another of these provinces and the increased exchange demanded more production, and better means of transportation.

Transportation Facilities. — When the eighteenth century gave place to the nineteenth, German transportation facilities were poor indeed. The wagon roads were deep beds of mud in rainy seasons, heavy masses of dust in summer, and rough frozen ruts in winter. One German prince is reported to have broken twenty-five wheels on one trip, because of the wretched roads. At that time it cost $85 to go from Leipzig to Frankfurt and it required an entire week; for the only way to travel was by post wagon. The same trip can now be made in a few hours for five or six dollars. The best and practically the only means of sending freight was by sailboat on the rivers, but the rates were so high that long shipments were out of the question. The year 1817 marks a great event in the industrial triumphs of Germany; for then the first steamboats were tried on the Weser River. Before long all the rivers were carrying products by steam. The greatest boon to German commerce came with the introduction of the railroad in 1835. At first only short lines were built, connecting local points; but soon thousands of miles of railroads connected distant cities. In the meantime Macadam of Scotland had discovered a new method of building substantial wagon roads. Germany immediately adopted the macadamized highways, which formed valuable arteries of trade from outlying districts to railroad centers.

Early in the century there were great differences in the prices paid for the same article in the various provinces. By 1840, when free trade between the states was assured

and the methods of transportation had been improved, prices became, not merely more nearly uniform, but lower. Now people in each district began to devote themselves to the production of those articles for which their district was best adapted. The consequent increased production helped to meet the greater demands caused by improved shipping; and yet the supply was insufficient.

Beginning of the Factory System. — Next to food, the greatest demands are for clothing; hence the spinners and weavers early profited by the improved industrial conditions. Community spinning mills were established at waterfalls in the hills or among the mountains. Weaving companies, formed to supply the necessary exports, engaged individual families to work for them. Spinning and weaving machines were run first by hand, then by animal power, and finally by water power. The spinning jenny was introduced long after it had come into use in England, but it proved just as great a boon to the Germans as to the English. By the middle of the century the introduction of steam power made possible a wonderful increase in the manufacture of textiles. This caused the development of the factory, though for a long time much weaving continued to be done in the homes, and some of it is still done there.

The Iron Industry. — The two decades between 1850 and 1870 marked the beginning of wholesale manufacture, not only in textiles but also in the metals. Improved methods in mining caused a great increase in the production of coal, and the iron manufactures were revolutionized in the middle of the century because coal was substituted for charcoal in the smelting of the iron. As a result the country soon entered upon its wonderful machine-making

age. Before 1850 not only England, but Belgium and France as well, surpassed Germany in iron output. By 1870 the latter had outstripped both her neighboring rivals, and in the early dawn of the present century she surpassed even England. To-day she ranks second among the world's iron producers.

Science Applied to Industry. — About the time that steam came into general use, the Germans began to realize that scientific study applied to production assured greater success than random experimenting. In the universities the laws of nature and the forms of matter were studied as they never had been studied before in any country, to the end that every effort at production should be crowned with success, whether in the paving of a street, the raising of potatoes, or the making of a toy. Nothing was to be left to chance. Seventy per cent success in mining, farming, or manufacturing was not to be any longer accepted. Men were determined that success should equal 100 per cent of the effort expended. No wonder that business expanded. Between 1850 and 1870 insurance companies were organized, which is an evidence that coöperation, mutual helpfulness, and confidence of man in man had taken the place of hatred, jealousy, and mistrust. During the same time many stock companies were organized for the purpose of developing mines, factories, railroads, and banks. Trade grew so fast that it called for and obtained new and uniform laws, removing ancient stumbling blocks and regulating commerce.

Factories Give Rise to New Social Conditions. — The industrial changes brought about new conditions of life. People moved from the country to the towns, from their individual cottages to rented suites in large apartment

houses. Cities grew faster than in any other country except the United States. Even some of the farmers, like their city cousins, left their homes for the factory in the morning and returned at night. Much of the farm work was left to the women. The city streets were thronged with people as never before. Housing problems of sanitation, plumbing, heating, and lighting presented themselves. Changes of all kinds came thick and fast.

Formerly the work of men and of women was the same; now it became different. Then one man might work at a variety of trades; now each devoted himself to one. But the wages increased; the people became thriving and happy. The population grew rapidly. By 1870 great pride was taken in the feeling of German brotherhood.

Wisdom out of Misfortune. — During the many years of serfdom, industrial weakness, and poverty through which Germany passed, there were wise men who kept their brains busy day and night thinking of plans for the betterment of the German people. While some men removed the interstate tariffs on commercial products, others introduced steamboats and railroads. Some developed mines, and others built factories. Instead of being completely discouraged over the defeat in a war, they bravely said, " We must free our peasants and give them the right of citizenship. Then they will be more intelligent, and gladly serve our country in her hour of need." When the great Emperor Napoleon defeated the Germans at the battle of Jena in 1806, the most thoughtful men said, " We must educate our children, so that this will never happen again. The nation that has the schools has the future." And then they began the development of their modern system of education.

The Birth of the German Empire in 1870–1871. — While Germany was still merely a confederation of states, Prussia made itself the leading province by successful wars with Denmark and with Austria. So powerful did Prussia grow that France was alarmed, and at last war broke out between them. The occasion of the war was a dispute as to whether a prince of the royal house of Prussia should or should not be permitted to accept the throne of Spain. The French, believing that such an arrangement would endanger their country, opposed it, but the Prussian king, William, refused to promise to prevent it. The Prussian prime minister, Bismarck, helped to inflame public opinion, and on July 19, 1870, France declared war.

Bismarck desired the war because he believed it would unify the German peoples and so make a propitious beginning of a great empire under Prussian leadership. His hopes were realized. The many German states joined in the common cause and fought so successfully that the Prussian king captured Paris in January, 1871, and thus the Germans gained full possession of the middle Rhine, two large rich provinces (Alsace and Lorraine) on its west bank, and $1,000,000,000 war indemnity. But the greatest victory was that the German states had so far forgotten their jealousies of one another that they were able to unite into one strong country. It was agreed that the king of Prussia should be the emperor of the new Germany. The twenty-three states swore to be loyal to the Fatherland; and William I, later called William the Great, became the first emperor of modern Germany. Then the people went to work in real earnest, not merely for their various states, but for the nation which bound them together as one great family.

GERMAN EMPIRE
SCALE OF MILES
0 20 40 60 80 100 150 200
NORTH SEA
BALTIC SEA
COPENHAGEN
SWEDEN
Malmo
DENMARK
HELGOLAND
Kiel
Hamburg
Altona
Lubeck
Bremen
Hannover
Amsterdam
THE HAGUE
Rotterdam
Antwerp
BRUSSELS
Cologne
Aachen
Dusseldorf
Dortmund
Magdeburg
Leipzig
BERLIN
Potsdam
Stettin
Danzig
Konigsberg
Memel
Tilsit
Elbing
Thorn
Bromberg
Posen
Warsaw
Lodz
Breslau
Liegnitz
Gorlitz
Dresden
Chemnitz
Prague
Nuremburg
Munich
Augsburg
Frankfort
Cassel
Halle
Kottbus
Frankfurt on the Oder
Stettin
Pilsen
VIENNA
AUSTRIA — HUNGARY
Cracow
Rheims
Nancy
Strassburg
Vosges Mts.
Mulhausen
Luxemburg
Metz
ALSACE-LORRAINE
SWITZERLAND
Longitude East from Greenwich
L.L. POATES, ENGR., N.Y.

Questions and Exercises

1. The United States, too, was once merely a confederation of states. Find out what the conditions of prosperity were at that time.

2. Why did many Germans emigrate to the United States?

3. What characteristics of the German people have enabled them to become a great commercial nation?

4. Make a list of the natural resources of Germany.

5. Which had more to do with German progress, — the natural resources or the characteristics of the people?

6. Do you see any resemblances between the early industrial development of Germany and of England?

7. What manly virtues do peace and industry develop?

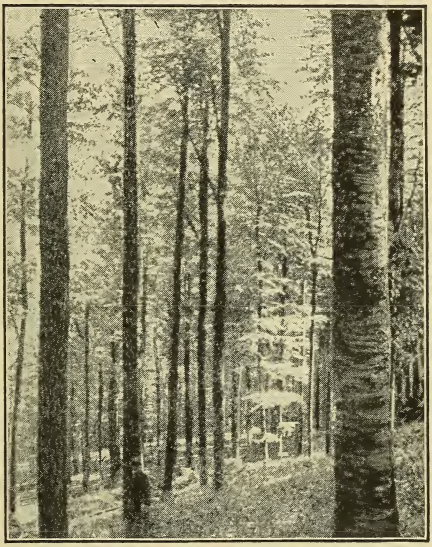
CHAPTER X

MODERN GERMANY

The New Industrial Era. — Although much had been accomplished in the industries before 1870, it was only the early dawn of a great era of prosperity. There were still many house industries; factories were comparatively few. The articles manufactured were often clumsy and crude, but always durable and reliable; nevertheless they could never compete with the far superior factory products of England. The two French provinces that had been gained in the war taught the Germans many valuable lessons, especially how to improve the quality of their manufactures. Before 1871 much of the money used to build up the factories, had to be borrowed at high rates of interest from foreign lands. After 1871 part of the war indemnity could be invested in manufacturing enterprises which required more and more of the labor of the nation.

From Agriculture to Manufacturing. — In the course of time the rapidly increasing population became too large to be supported by the food that could be raised on German soil. People were compelled to turn their attention to the making of articles that could be sold in foreign markets. These factory products had to pay for imported food. Necessity, then, drove this country to manufacturing, and the increasing prosperity promoted the change. The transition from house industry to factory employment caused considerable suffering to the laboring classes in Germany, as it had in England, but it was not so severe, for the change came more gradually.

The industrial activity, together with the new national aims, necessitated a uniform money system, which was finally secured in 1873. The large surplus of factory products caused the nation to develop international trade, not only with her European neighbors, but with countries far away beyond the seas. The government gave subsidies to some manufacturers, to enable them to undersell their competitors in foreign markets.



A German forest.

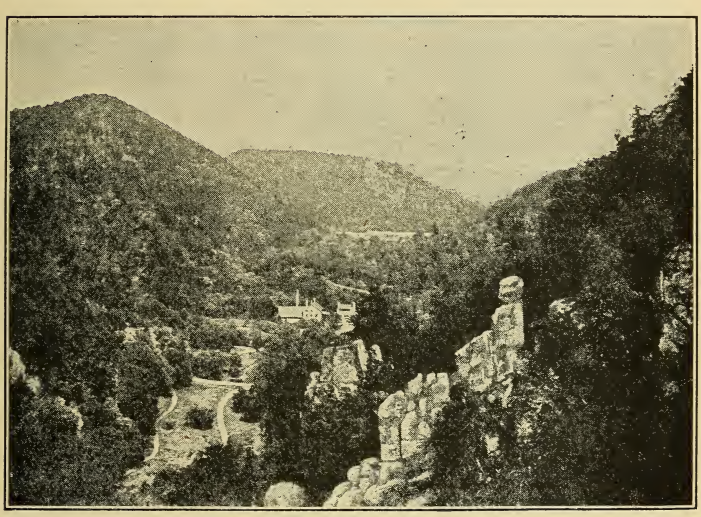
Germany's Natural Resources. — While the great industrial progress of Germany is largely due to the energy and perseverance of the people, yet the natural advantages of the country have been important factors. Location, surface, climate, soils, minerals, forests, and waterways are the chief geographic influences in the development of Germany.

Location and Climate. — The location of Germany is both an advantage and a disadvantage. Her position in the heart of the most highly developed continent, where she is surrounded by seven prominent productive nations, is an asset because it affords excellent trade opportunities. These surrounding countries are good markets for her products and from them she receives articles that she lacks. There is also a good income from the transit trade which crosses her territory from the neighbors on one side to those on the other. On the other hand likelihood of war is increased in proportion to the number of neighbors. Again Germany is favored by her two fine water boundaries, the Baltic and the North seas. On the whole, it may be said that the location of the country for trade is excellent.

Her position between 47° and 56° north latitude places Germany in the North Temperate Zone, the most favorable to man's progress. But being in the northern half of the zone she has the cool temperate rather than the warm temperate climate. The mountains at the south shut out the warm, southern breezes, while the low plains at the north invite the rigorous winter winds; hence a large part of the year is cold. The weather is tempered considerably by the mild breezes from the Atlantic, but their influence is less felt in eastern Germany, where consequently the contrasts between summer and winter are greater than in the west. The rainfall is ample to make this country compare favorably with others in its returns from field, garden, and forest.

Surface. — The surface features of Germany consist of every variety of landscape except the very highest mountains. In the northern part is a great stretch of lowland, which occupies the larger part of the country. The land

gradually rises from the lowlands in the north to the highlands, ending finally in the majestic snow-covered German Alps of the south. The green valleys afford fine pastures, which give rise to profitable stock raising. The forests, covering mountain slopes, hill sides, and sandy lowlands, are noted the world over for their beauty as well as for their valuable timber. Germany's scenery has attracted many

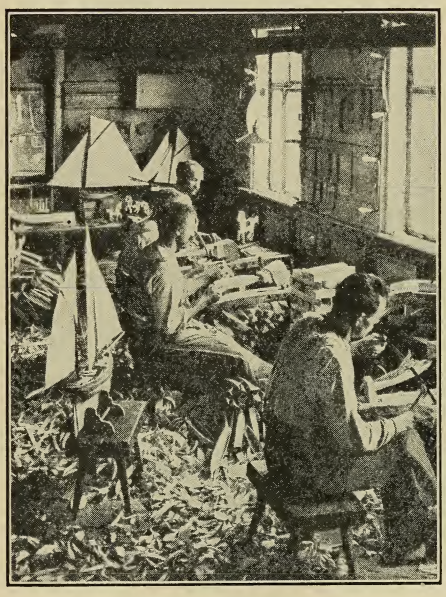


A scene in the Hartz Mountains, Germany.

tourists who contribute much to the prosperity of the country, for they need food and shelter, and frequently buy articles to take home. The tourist trade is an important occupation in most European countries.

The tourist interests have received attention ever since 1870. Munich alone has had more than 500,000 guests annually, almost as many as its inhabitants, and they spend millions of dollars for board and lodging, besides hundreds of

thousands of dollars for souvenirs, to say nothing of the sums paid for theaters, concerts, street-car service, and other incidental expenses. In 1905 the Munich railroad authorities received $4,000,000 for passenger tickets and baggage charges. Railways have been built into the very heart of the mountains; and wayside inns are found at convenient intervals along the many forest and highland paths. Scenic improvement societies have been formed to preserve and cultivate the beauties of nature.



A German toy shop.

Household Industries in the Forests. — The evergreen, beech, maple, walnut, and oak forests that grow on barren lowlands and nonproductive highland slopes are well scattered throughout the German Empire. They are of inestimable value to wholesale manufacturers in large cities. Besides, they give rise to many small household industries in the midst of the forests, such as the manufacture of wooden clocks in the Black Forest, and of willow baskets, matches, wood pulp, and celluloid in the forests along the Main River. In other places musical instruments, such as violins and zithers, are

made by hand. Toy making, which originated in the forests, is still carried on there to some extent. Dolls, furry animals, boats and ships, wooden soldiers, dominoes, the whole menagerie of Noah's ark, guns, tool chests, and toy music boxes are made of wood. Toy models of houses are made of papier-mâché, that is, a mixture of wood pulp, clay, and glue.

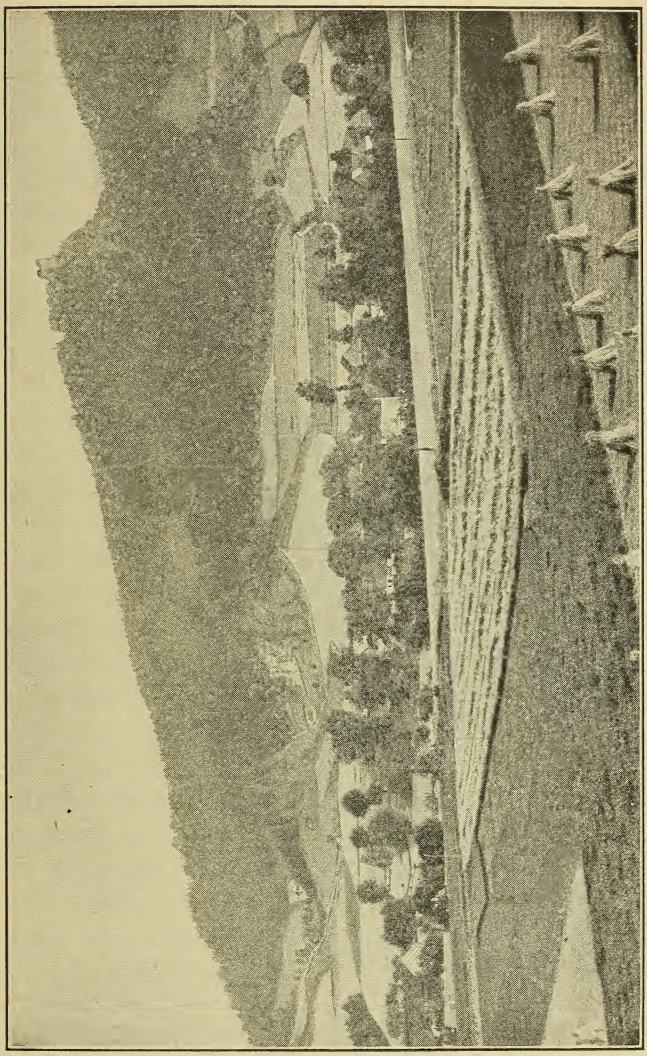
Many families devote themselves to the manufacture of wooden animal toys. The father makes the cattle; the mother, the sheep; the older brother, the horses; the sister makes the horns and tails; and the youngest member of the household pastes them on. Finally the grandfather paints them and then they are ready for the market of the world. Thus the humblest homes in Germany play a part in international trade. It is a poorly paid business; for all this labor the family receives the sum of four dollars for six thousand toys. This is probably the poorest paid work of modern German industries.

German Forest Conservation. — Germany is very proud of her forests, which cover one fourth of the area of the country. One third of them belong to the state governments and the crown; and one fifth are the property of various communities. The German word "Wald," meaning "forest," occurs in the names of many places; for example, "Schwarzwald," the "Black Forest," and "Thuringerwald," the "Thuringian Forest." While they yield abundant timber, the forests do not decrease; for no waste is allowed. Men, called foresters, are specially trained to supervise and care for the woods. Only mature trees are cut down, and a sapling is planted in the place of each tree removed. Underbrush, which readily catches and spreads fire, is not permitted to grow. No

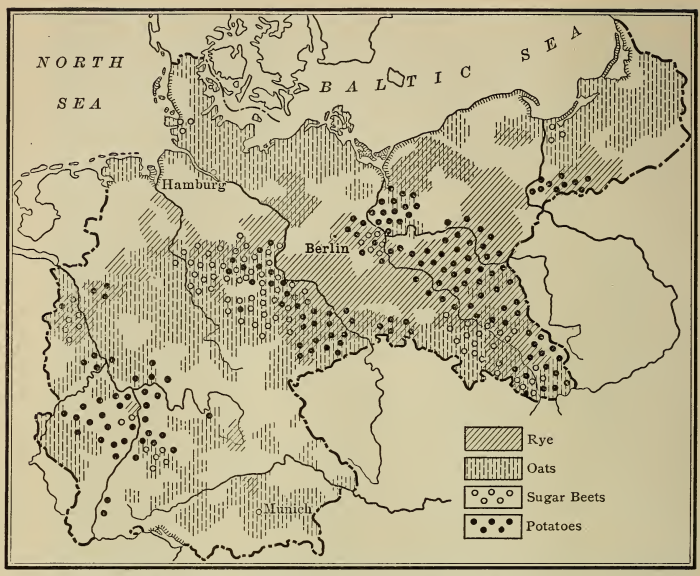
people understand forest conservation better than the Germans do.

The German Soil. — Nine tenths of the land in Germany is productive. The remaining one tenth comprises marshes, swamps, mountain rocks, and sandy wastes. The area of fertile soil, suitable for field and garden crops, is about one half of the total productive area. The tracts of poor soil and steep slopes are occupied by permanent pastures and forests.

Improvement in Agriculture. — For hundreds of years prior to the nineteenth century agriculture in Germany was carried on with almost no improvement. Poor methods of farming were used and the yield of farm products was extremely low. About 1812, one man, who had studied the improvements in English farming, wrote and lectured much about better methods in agriculture. After a time his advice was followed by the large landlords; and as soon as the small landowners saw the good results of the new methods they too adopted them. Agricultural colleges, which were established during the first half of the nineteenth century did much to improve farming. They introduced modern rotation of crops and better methods of cultivating the soil. The old-fashioned tools were discarded, and because the Germans could not at that time make better ones they imported farm implements from England. In due time the land was more carefully fertilized; greater pains were exercised in the selection of seed; new varieties of plants were developed; and soils were carefully studied in order to determine the crops best adapted to them. As a consequence the farming lands were increased considerably in area, from one third of the country in 1800 to almost one half in 1900; and with this increase in



Fertile farm lands in Germany.



Leading agricultural products of Germany.

acreage came a greater increase in the yield per acre.

Agriculture at the Present Time. — Agriculture is a more important industry in Germany than it is in Great Britain, because her territory is more extensive, her continental climate gives her a greater variety of crops, and her sunny harvest season is better adapted to the gathering of the grains and hay than are the foggy summers of Great Britain. The leading crops of Germany are potatoes, rye, oats, hay, barley, wheat, and sugar beets.

Grains. — The production of rye and oats is far greater than that of wheat and barley. In the yield of rye and barley Germany ranks second, being excelled only by Russia, which is a much larger country. In the yield of oats Germany ranks third, being outranked by the United

States and Russia. While rye is the chief bread cereal of the German people, yet a larger increase in wheat production over that of rye indicates a growing use of wheat bread. In normal times much rye from Russia and wheat from Argentina and the United States are imported.

Potatoes. — In the production of potatoes Germany excels all other countries. Potatoes are a favorite article of food among the common people. Moreover, they have been much used lately in the manufacture of alcohol.

Sugar Beets. — The sugar beet is a fleshy root resembling the common beet and is from one to three inches in diameter across the top. It is white and often gently tapering. It grows in any soil that produces potatoes, and flourishes in a cooler climate than the sugar cane. The amount of sugar in a beet depends more upon the quality of its juice than upon its size, and is increased by properly fertilizing the land. The beet requires less tedious labor in planting than the cane but the work of cultivation is more arduous. When the roots are harvested they are washed, sliced, and put into reser-

Cultivating sugar beets.

voirs of hot water to extract the juice, which is boiled down and refined into sugar.

At present the world produces as much beet sugar as cane sugar. Germany ranks first in the production of sugar beets and in the manufacture of beet sugar. Great Britain is Germany's best market for this product. Much of the German sugar is sent also to Norway, Canada, Japan, Switzerland, Denmark, Sweden, Uruguay, Netherlands, and Chile. Five causes explain Germany's lead in beet sugar. They are: suitable climate and soil; painstaking cultivation; the research spirit of the Germans, which discovered the best method of extracting the sugar from the beets; the tariff on cane sugar imports; and the government bounties on exported beet sugar.

Other Crops. — The other noteworthy crops of Germany are hops, tobacco, and fruits. Intensive truck gardening and flower culture receive much attention throughout the country, both to meet the demands for food and to satisfy the sense of beauty. Increasing interest is taken in greenhouse plants which rival the flowers of sunny Italy and France. Fruit trees, especially plums, apples, pears, and cherries, surround the villages and line the country roads. Grapes are raised on the terraced slopes of many hills. Every one has heard of the luscious purple fruit that ripens in the vineyards on the banks of the Rhine.

Animal Industries. — Many meadows abound in western and northern Germany, where the sea causes an unusually damp atmosphere, favorable to the growth of grass. They are also found on the plateaus and mountain slopes in the south, where there is a greater condensation of moisture than in the warm lowlands. Sixteen per cent of the area of Germany consists of natural pasture lands. These grazing

areas and meadows furnish food for large numbers of live stock. The principal cattle and dairying interests are located in the Bavarian Alps and other southern highlands, and in certain sandy limestone districts along the northern coast near Holland. Many cheese and butter factories have been built in the dairy sections.

The sheep industry, which was prominent before 1860, has fallen off considerably lately on account of the recent competition in wool production by Australia and Argentina. A limited number of sheep and also of horses are raised in the eastern provinces where the rainfall and consequently the grass is less abundant than in the west. Hog raising, in which Germany ranks among the foremost countries on earth, is on the increase, inasmuch as pork forms a large part of the flesh food of the people. Even the poorest peasant fattens one or more hogs a year. Poultry raising on a small scale is quite general, especially in the east; but wholesale production is practically undeveloped. Consequently the imports of live and dressed poultry and eggs are heavy. About one fourth of the honey made in Europe comes from bees cared for in Germany. The fisheries in inland waters and on the North Sea employ between thirty and forty thousand men. Still the fish imports amount to twice as much as the value of those caught at home, in spite of the efforts of the government and local fish associations to promote this source of food supply. Although there has been such wonderful progress in late years in the animal industries of this country, meat is still a large part of her imports.

Mineral Wealth. — Germany is one of the richest countries in the world in minerals. For sixty or seventy years she has lost no time or energy in developing this underground

Chief minerals of Germany.

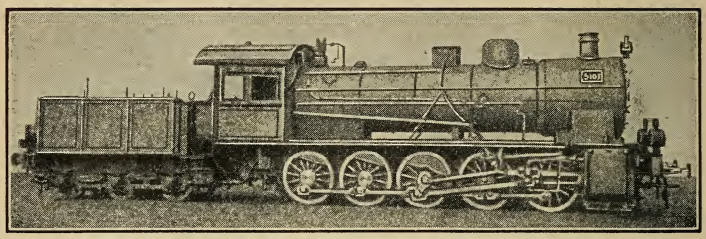
wealth. Her greatest mineral region lies in the middle belt of the country. Extending eastward to Russia and westward to Belgium, and along the Rhine as far north as Holland, it occupies fully a third of the area of Germany. Here are unusual deposits of coal, both hard and soft, and also of iron ore. These form the basis of modern Germany's industrial success. Mines and smelting works employ one fifth of the German laboring classes. Coal, which is everywhere the mainstay of the manufacturing industry, is even more abundant in Germany than in Great Britain, though at present her output is still excelled by the United States and England. It is estimated that the rich mines along the lower Rhine will last 1300 years if 100,000,000

tons are mined annually. Another large coal field lies in southeastern Germany.

Germany has other rich mineral deposits. It is unsurpassed in the production of zinc, potash salts, and lithographic stone. Nickel, copper, silver, and lead also yield handsome returns. There are inexhaustible supplies of slate, marble, and fine building stone, as well as of table salt. The potash salts, valuable as a fertilizer, have become a leading export. Only a small part of the product is used on the home farms; in normal times the greater part goes to England and the United States.

Modern German Manufactures. — In addition to the marvelous development of production in Germany on farms and in the mines since the beginning of the nineteenth century wonderful changes have also taken place in manufactures. In the first place the making of articles merely for personal or family needs has been replaced by wholesale production for the masses. Household industries have given way more and more to factories. However, we must not believe that the factory has robbed the home of all its part in manufactures; for silks and velvets of superior quality are still woven in private homes; toys also are made by people in their own dwellings; pottery products, certain kinds of metal wares, as well as other articles, are even yet, to a limited extent, home manufactures. Division of labor has been pushed so far that no one can become master of a complete trade. New materials are substituted for old ones; for example, iron for wood, and cement for stone. Better and better products are turned out faster and faster to meet the demands of an ambitious and energetic people.

Iron and Steel Industries. — The German iron and steel industries are the most important in Europe. Much of



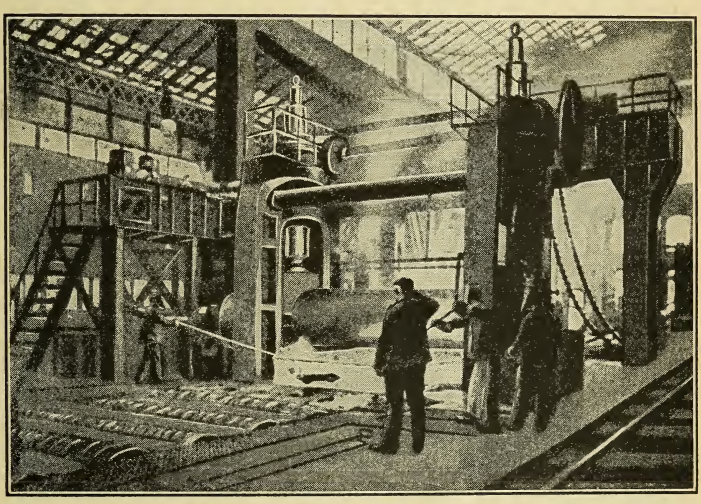
A modern German locomotive.

these products is consumed in the making of machinery for mining, smelting, spinning, weaving, and other industries. In late years bridges and buildings have been constructed largely of iron and steel. Locomotives, street railways, iron steamships, steel furniture, steel rails, firearms, skates, saws, files, and cutlery are made in the many cities clustered about the Rhine. As one rides through that part of the country around Essen, where the largest steel mills in the world are located, the cities look like forests of smokestacks, and the noise of machinery fills the air.

Textile Industries. — Even before the factories were introduced, Germany had a reputation for her linen and woolen fabrics, which grew out of her sheep industry and the raising of flax. Now she produces fewer sheep and manufactures more woolen cloth, chiefly from the raw material which she receives from abroad. Breslau has large woolen factories. Cotton manufacturing is also extensively carried on, especially at Cologne, Elberfeld, and Chemnitz, the latter sometimes called the Manchester of Germany. Silks and velvets are made in the towns centering around Cologne. Germany depends upon the United States for her raw cotton, upon China and Italy for the raw silk, and partly upon Russia for flax. Before

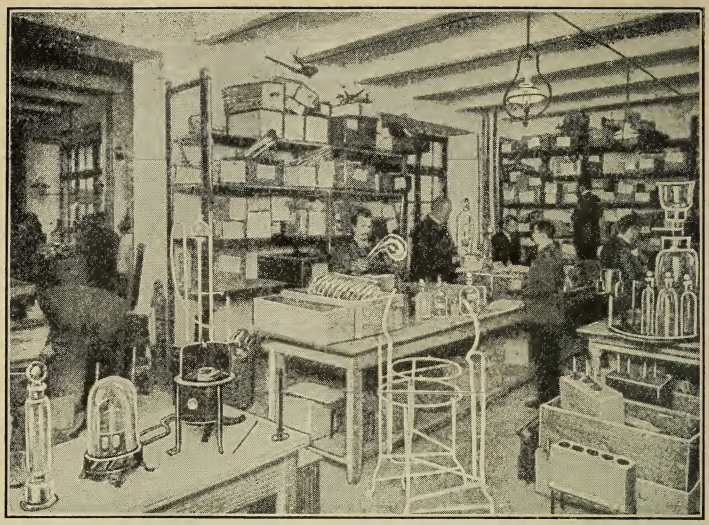
the Great War she experimented with cotton culture in her African colonies in the hope of making herself less dependent upon others for this raw material.

The Chemical Industry. — The chemical industry ranks third among German manufactures. German chemists understand the art of extracting valuable by-products from plants, animals, and minerals. Materials which are usually called waste are taken into the German laboratories. All kinds of experiments are tried with them until they yield something profitable. In 1827 the first chemical laboratory was established at one of the universities, where



Rolling steel plates in a German steel works.

men tried many experiments and made some valuable combinations of acids and salts. To-day there are many such laboratories not only in universities but in factories as well. Her early building up of schools and the research habit are now making Germany industrially efficient.



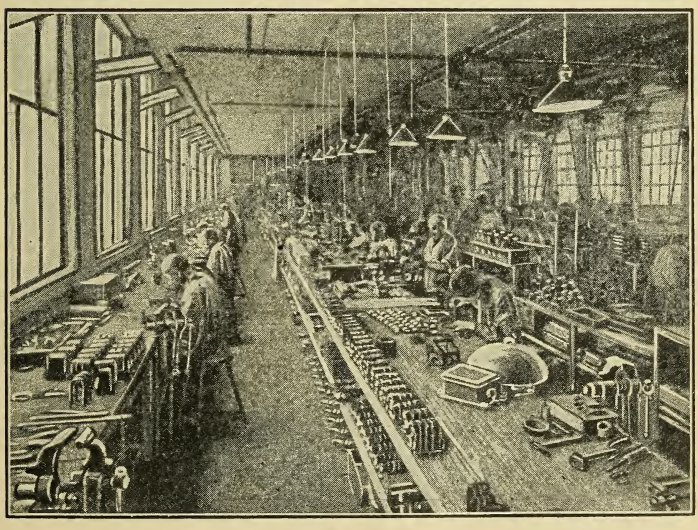
A chemical laboratory.

Great sums of money are invested in the manufacture of chemicals and they yield large annual dividends. In 1860 Germany was compelled to import almost all her dyes. Fifty years later she was able to furnish the world with four fifths of all the dyestuffs used. She imports coal tar from other countries, manufactures it into dyes, and sends them back to those same countries at greatly advanced prices.

A striking case of chemical development is that of indigo. Some years ago the raising of the indigo plant was a flourishing business in India and was controlled by the English. From the coal-tar by-product a German chemist learned to extract indigo. Within a few years England was buying more indigo annually from Germany than she had previously bought from India. Some of Germany's

iron ore contains phosphorus, which lowers the quality of the steel made from the iron. In 1868 a process was discovered of separating the phosphorus from the ore. The phosphorus thus obtained is now manufactured into a commercial fertilizer worth $45,000,000 a year. By 1910 Germany excelled all other countries in the chemical industry, and her chemical products each year were more valuable than all the machinery she produced.

Electrical Industries. — Another of Germany's most profitable sources of income is her electrical industries. Thirty years ago the use of electricity was almost unknown except in telegraphy. To-day it enters into scores of industries; such as electric railways, lighting of houses, telephones, electric motors, and wireless telegraphy. Thousands of people are employed, and billions of money are



A German electrical works.

invested in these industries. Germany leads all Europe and ranks second in the world in electrical industries. This country has more than a third of the continent's electric railways, and Germans have built many of the roads for other European countries, and some for South America. She manufactures more electrical machinery than any other nation except the United States; and exports much of it to other nations.

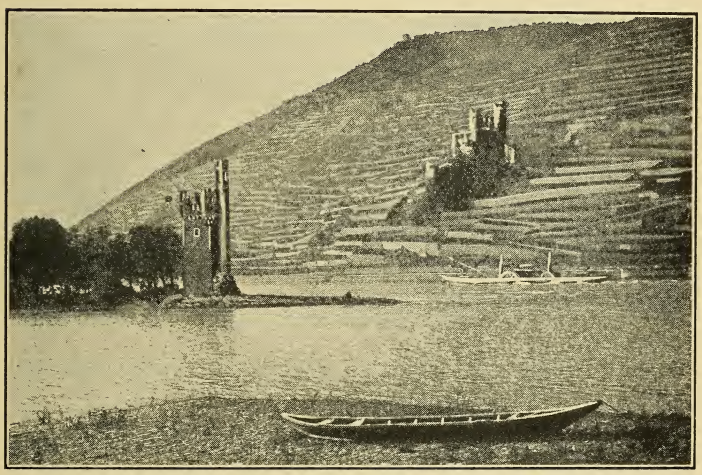
Other Manufactures. — While iron and steel goods, textiles, and chemicals are the leading manufactured products, yet there are many other important manufactures. Germany is renowned for its book-publishing business, whose chief center is Leipzig. Beet sugar, beer, alcohol, musical instruments, laces, tobacco, leather, furniture, and jute fabrics are a few of the many products that are extensively manufactured.

"Made in Germany." — During the last thirty years and more, articles " made in Germany " have found their way into every quarter of the earth. While such products are not as a rule noted for their elegance they are acceptable for their serviceableness. Germany can make and does make some beautiful things, but most of her manufactures are useful rather than beautiful. This policy won for her so much international trade that she has gained the second rank among the nations, next to England, in foreign commerce.

Commerce of Germany. — From a deplorable condition of domestic trade and a very limited foreign commerce, Germany has developed into one of the three leading commercial nations. The railroads, navigable rivers, and canals provide efficient means of transportation within the country itself; and German ships bring raw materials

from all parts of the world and carry away the products of German factories to all lands.

The Rivers of Germany. — Germany is rich in navigable rivers. The Rhine, Weser, Elbe, Oder, and Vistula are excellent trade highways connecting the north with the south; and the Danube is most valuable in connecting Germany with southeast Europe. In the last decades Germany has steadily extended and improved her waterways.



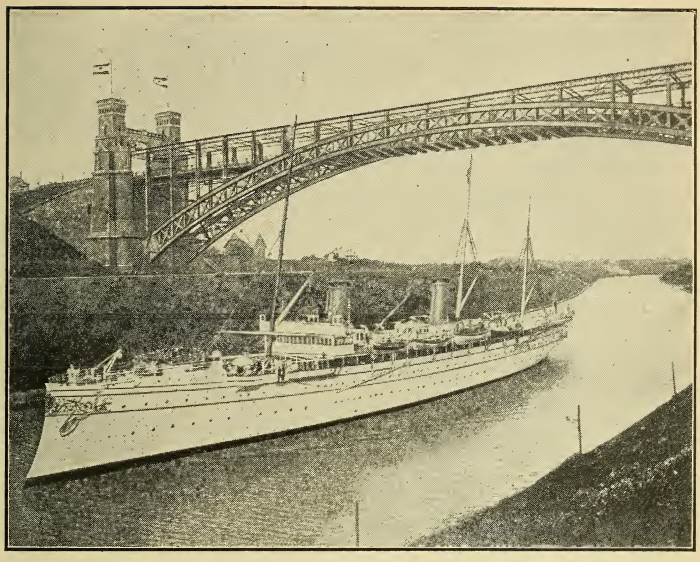
A scene on the Rhine.

The channels of the rivers have been deepened, the banks have been walled up with masonry, and ships adapted to the rivers have been built.

The Rhine River is the greatest inland commercial waterway in the Empire. Within twenty-five years, more than $5,000,000 have been spent on the bed of this stream alone. It is the most beautiful of all European rivers, and has long been far famed for its grim ruined castles and ancient

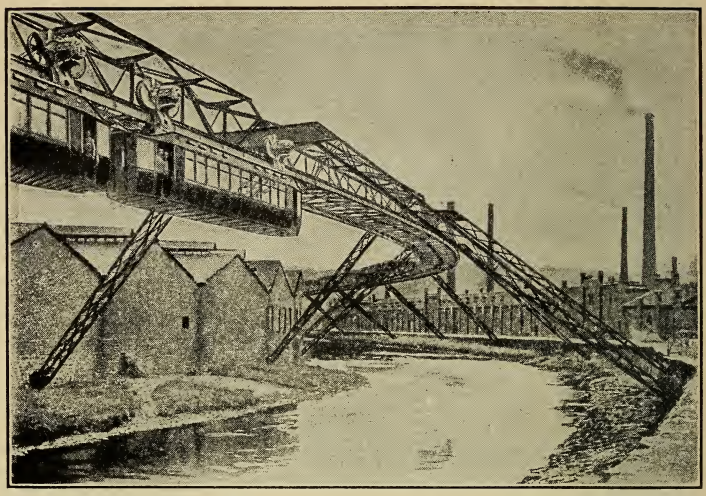
towers with their countless echoes of the past. Many legends and stories cluster about the Rhine. Fantastic tales are told of imprisoned princesses, and kings' children turned to stone, of dragons, and whirlpools, and sirens enchanting sailors into destruction. While the Germans love this river for its romantic legends and historical associations, they are to-day putting their best efforts into making old Father Rhine a thoroughly modern waterway. The 10,000 steamers plying up and down the stream, carrying coal, iron, grain, wine, lumber, and factory products, pass great national monuments, fruitful vineyards, strong fortresses, and busy wharves of thriving cities. The Rhine and the Elbe carry German goods toward the North Sea, whence the products start upon their ocean journeys toward the west. Several other rivers, farther east, carry freight to the Baltic Sea. The Danube transports merchandise from southern Germany, southeast into Austria-Hungary, and through the Balkan states to the Black Sea.

Canals. — Natural east and west water routes were not nearly so plentiful as those between the south and the north. So canals were built from river to river, connecting the German waters with those of France, Austria-Hungary, and Russia. The Great Midland Canal unites all the rivers from the Vistula to the Rhine. The Kaiser Wilhelm Canal extends from the mouth of the Elbe in the North Sea to Kiel, an important port on the Baltic. This canal, sixty-one miles long, greatly increases the trade of the Baltic region, for it saves the ships much time and many possible dangers incident to the cold, stormy water route north of Denmark. Including rivers and canals Germany has nearly 9000 miles of navigable waterways.



The Kaiser Wilhelm Canal.

Modern German Railroads. — In 1835 Germany began the construction of railroads. At first the roads were built with private means. About 1880 the state began to build new railways and to buy old ones; and to-day the government owns almost all the railroads. No country offers cheaper transportation than Germany. The railroads, extending in all directions, rank next to those of the United States in mileage, equipment, and importance. Within this country are many transcontinental railroad lines knitting firmly together all parts of Europe. Thus Germany has become the heart in which the great trade highways center and from which they radiate. It is the midland through which pass the routes that connect Copenhagen on the north with Rome on the south, Petrograd



An electric railway in Germany.

in the northeast with Lisbon in the southwest, Constantinople in the southeast with London in the northwest. Almost any city in Europe can be reached from Berlin within twenty-four hours. Germany's position in the heart of the continent gives her great railroad advantages for European trade over her nearest rivals, England and France.

Bagdad Railroad. — Because Germany supported Turkey at a time when she was in trouble, the Sultan gave the Germans the right to build a railroad to the Persian Gulf by way of Bagdad. Such a road, when completed, would enable German freight cars to reach the Persian Gulf by way of Berlin, Vienna, Constantinople, and Bagdad without unloading, thus giving extraordinary facilities for oriental trade.

Postal Service. — Not until after 1830 was any provision made by the government to give mail service to the rural

population living in remote villages. Since the close of the nineteenth century, mail has been delivered every day, including Sunday, in every city, town, and hamlet of Germany. Formerly the postage on a letter depended on the distance it traveled. In 1868 this was changed to a uniform cost of about two cents for every ordinary letter. The number of letters delivered increased from an average of three for each person in 1850 to more than seventy in 1905. For many years Germany has had a cheap and excellent parcel post.

Foreign Commerce.[1] — The foreign commerce of Germany is greater than that of the United States. Her imports, considerably greater than her exports, are raw cotton and wool, rye and wheat, hides and skins, eggs and butter, petroleum, and precious metals. The chief exports are cloth and clothing, iron and steel goods, machinery and instruments, leather goods, sugar, chemical products, books, and maps. Germany receives more imports from Russia and the United States than from any other two countries, and sends more exports to Great Britain than to any other country.

Germany's Continental Trade. — Germany has an extensive trade with her European neighbors. Rich countries, like Austria-Hungary and Russia, form a large part of her boundary line. For the most part, plains or low mountain passes give her easy railroad entrance into adjacent countries. The rivers, too, form trade routes into other lands; for example, the Rhine into Holland, the Vistula into Russia, and the Danube into Austria-Hungary.

[1] The account of German commerce (pages 145–147, 151), as in general the account of all industry and commerce, represents conditions as they were before the Great War which began in 1914. The permanent effects of the war cannot yet be ascertained.

Russia sends her rye, wheat, lumber, eggs, oats, flax, live poultry, and furs; from Austria-Hungary she receives soft coal, lumber, cattle, and fruits. In return, Germany sends these countries hard coal, coke, paper, woolen and cotton cloth, iron manufactures, machinery, dyestuffs, leather, books, and musical instruments.

Germany's Ocean Commerce. — Seventy per cent of Germany's foreign trade passes over the ocean; and German ships sail on all seas of the globe. A specialty is made of transatlantic business with the Americas and Africa, carried by two of the largest steamship companies in the world, the North German Lloyd with headquarters at Bremen, and the Hamburg-American Line centered at Hamburg. German imports and exports are carried also through the Mediterranean Sea, the Suez Canal, the Indian Ocean, and the Pacific to or from Asia and Australia.

German Ships. — German steamships are constantly increasing in size and capacity. Large Rhine steamers carried 400 tons in 1840; 800 tons in 1880; and 2000 tons in 1900. One modern Lloyd ocean steamer has a greater tonnage than the entire merchant marine of Bremen in 1825. Iron and steel ships are displacing wooden sailing vessels. Nevertheless Germany is still building huge five-mast sailing ships. One of them carries a tonnage equal to twenty-five trains of thirty-one freight cars each.

World-wide German Interests. — Germany is compelled to take the entire world as her commercial field because her large population is increasing nearly 1,000,000 a year. There is not land enough to farm, so the people must make a living by manufacturing and trading. The Germans search every quarter of the globe for opportunities in industry and commerce. They own vast areas in Brazil,

and thousands of miles of railway in Turkey and Asia Minor. They do great transportation and electrical business in South American cities. They own coffee plantations in Central America; mines and railways in China; tobacco plantations in Sumatra; cotton plantations in Egypt, and rubber plantations in the Congo.

Business houses compete with one another in developing foreign commerce. One firm owns large mining interests, extensive plantations, and ranches in Morocco. Other firms conduct steel mills and iron mines in Scandinavia, Russia, and France.

German banks furnish money with which foreign business is developed. One bank is building the Bagdad railway; another has charge of the railways in Venezuela. Even the Kaiser is interested in a trust that spares no efforts to gain industrial opportunities abroad.

The Rapid Growth of Cities. — As a result of the marvelous manufacturing and commercial activity, German cities have had an unusually rapid growth. The old city walls, which formerly protected many a town, have long been unable to hold the increasing numbers of people who have flocked from rural sections. Hundreds of cities have large districts, stretching beyond the original limits. The old buildings, streets, walls, and bridges contrast strangely with the modern sections of these cities.

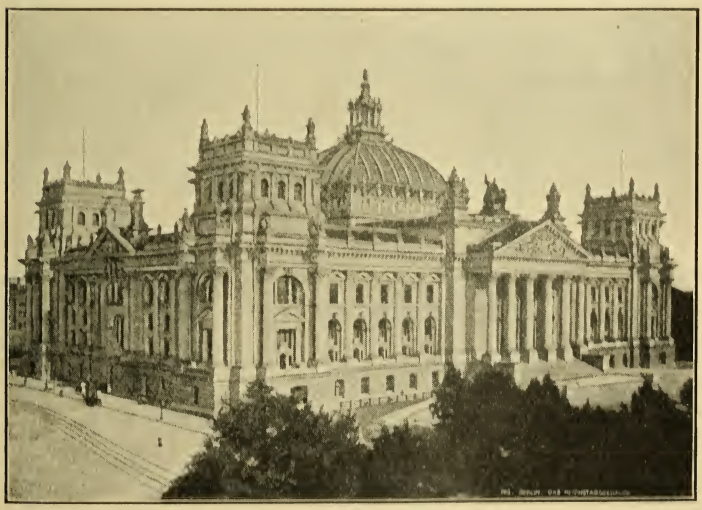
Berlin. — Berlin, the fifth largest city in the world, is one of the most important railroad centers of Europe and one of the chief money markets on the globe. It lies in the northern plain, midway between the coast and the southern highlands, near both the Elbe and the Oder. Rail, river, and canal connections have made it a collector and a distributor of products for the surrounding country.

A street scene in Berlin.

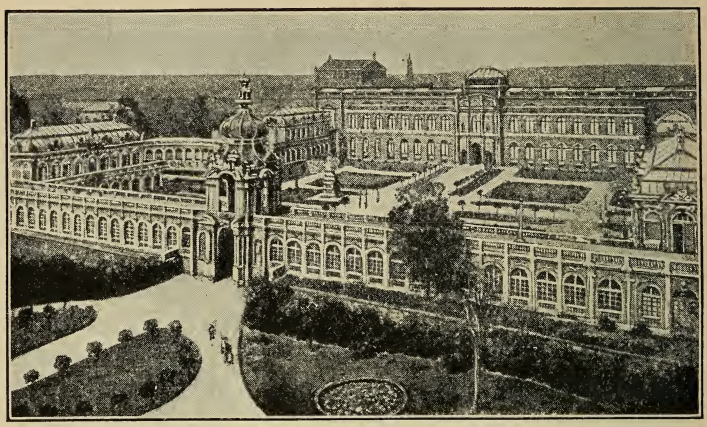
Although Berlin is an important manufacturing center, it is a beautiful city. Broad streets, stately palaces, rich shops, magnificent hotels, luxurious houses, and wooded parks stamp it at once as one of the great capitals of the world.

In Berlin are a number of museums, containing interesting relics from all continents. Art galleries are filled with hundreds of paintings and sculptures. A dozen opera houses and more theaters provide amusements. Many concert halls furnish excellent musical entertainments. The Thiergarten Park, one of the largest in Europe, is a happy recreation spot for thousands of people from early morning until evening. In it are countless trees, artificial fountains, and many statues and busts of noted rulers, scientists, musicians, artists, and poets.

Every kind of school from the kindergarten through the University, trade and professional schools, schools for un-



The Reichstag Building, Berlin.



The Dresden Museum.

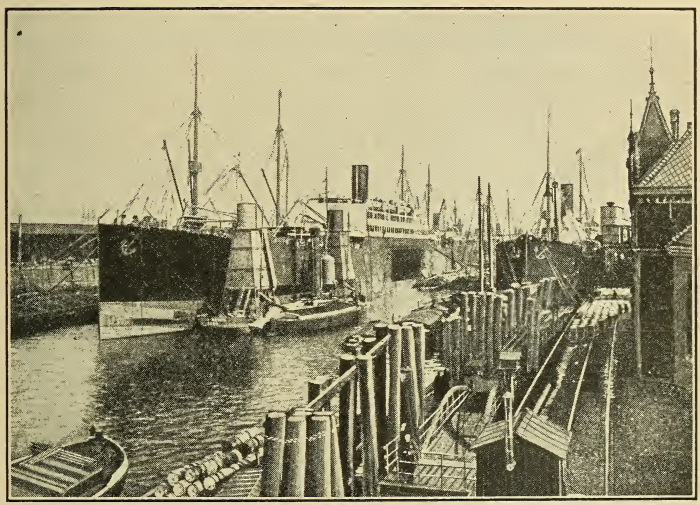
fortunates, day schools, night schools, and Sunday schools offer courses of education to all.

Dresden and Munich. — The wealthy state capitals Munich and Dresden are important interior trade centers and are noted especially for their art interests. They contain fine galleries, visited by thousands of tourists. Many foreigners study art and music in these cities. One of the most valuable collections of treasures in Europe is to be found in Dresden. It is worth millions of dollars and is composed of marvelously wrought bronzes, finely carved ivory, beautiful pictures, watches, goblets, statues, gold and silver plates, priceless emeralds, rubies, pearls, and diamonds; rings, swords, and other articles of decoration belonging to former kings. Dresden is also renowned for its beautiful china.

Munich has one of the finest industrial museums in the world. It contains wonderful exhibits showing industrial processes and products. After one has spent several days

in this museum he has a profound respect for the industrial accomplishments of man.

Hamburg and Bremen. — Quite in contrast with Dresden is the city of Hamburg, the greatest continental port in Europe. In its busy harbor are hundreds of ships, arrived from many foreign ports. The city is on the Elbe, far enough inland to afford a fine shelter for vessels. Hamburg



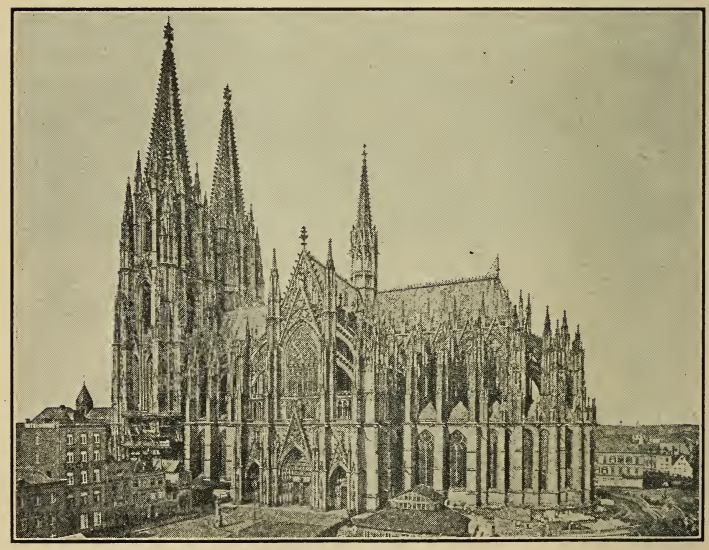
Docks at Hamburg.

collects the larger part of the rich industrial products of Germany and sends them out to other European ports, to Asia, Africa, Australia, South America, and the United States. Ships bring in tea and silk from China, wool from Australia, rubber and ivory from Africa, coffee and rubber from Brazil; cotton, corn, wheat, meat, copper, iron, petroleum from the United States; and fruits from the Mediterranean countries. After the great steamers have

come up to the wharves, the bales of cotton are lifted by pulleys, cranes, and derricks directly into the warehouses. Other products are transferred at once into boats and carried up the canals and rivers to interior sections, or they are loaded into freight cars. Bremen, the second port of Germany, handles the bulk of the emigrant traffic. It is also a large tobacco, cotton, and rice market.

Leipzig, one of the chief manufacturing cities of Germany, can boast of being the greatest book center of the world. It has excellent printing schools where type-making, illustrating, photography, and engraving are taught. It is also one of the world's chief markets for furs, pelts, and wool.

Other Cities. — Dozens of other rich and thriving cities might be mentioned. There is Cologne on the Rhine, with



The Cologne Cathedral.

its famous cathedral and noted perfumes; Nuremberg, with its toys; Mainz, the birthplace of Gutenberg, who invented printing; and ever so many cotton, woolen, iron, and steel centers. In all of them one sees the hurry and bustle of business.

Conclusion. — "The Kaiser has during many years exerted upon his people a stimulating force which has raised to blood heat the political temperature of that people, the result being that human energies of all kinds are pressed into the service of the State to a degree which elsewhere is unknown." [1] This national efficiency, developed through strenuous labor coupled with untiring vocational and patriotic education, enabled Germany, almost single-handed, to wage war with three Great Powers for over three years, and finally to face at the sword's point the larger part of the world. Under an autocratic government, the blessing of great industrial power was perverted to serve the policy of political aggression.

Questions and Exercises

1. Why is it that more people can be supported by manufacturing than by agriculture?
2. What are the two greatest industrial resources of Germany?
3. Why are there so few cities in northeastern Germany? Why are the manufacturing cities so well distributed?
4. Make a list of the names of articles on which you find the trade-mark "Made in Germany."
5. Find out all you can about German forest conservation.
6. How does British commerce differ from that of Germany?
7. Hamburg is the chief seaport of continental Europe, although it is not on the coast. How has its commercial supremacy been made possible?

[1] J. Holland Rose, "Origins of the War."

CHAPTER XI

POLITICAL AND SOCIAL CONDITIONS IN MODERN GERMANY

Government of Germany. — Germany is a constitutional monarchy. While the nation consists of a number of states, each with its own state government, yet the national government is very strong and exercises large power over the whole country. Affairs of universal interest, such as postage and coinage, are in the charge of the national government instead of the individual states, as formerly they were. Practically all of the railways and telegraphs are owned and managed by the government. The government is untiring in its efforts to develop the German nation. Laws are passed to promote education, manufacturing, commerce, and other interests of the people.

The Ruler. — Emperor William II is the ruler of this monarchy. He inherited the throne from his father in 1888. Kaiser Wilhelm, as he is known in Germany, is an intelligent man of great power and ambition. The Kaiser is also the king of Prussia, a state comprising more than half of the area and population of Germany. He appoints the chief officers of Prussia and of the empire; they are subject to his will and are not removable, as in other constitutional monarchies, by the lawmaking body that represents the people. All treaties are made by the Kaiser.

The Law Makers. — Although the emperor holds his position for life, he is supposed to be somewhat controlled in his actions by the law makers. He cannot pass a new

law himself. New laws are proposed by the Bundesrath, a body of about sixty members appointed by the governments of the states. They are then debated in the Reichstag, composed of about four hundred men chosen by the people voting directly, as our Representatives are; and they become law if passed by both bodies and approved by the Kaiser. In reality, these law makers have very humbly carried out the Kaiser's wishes, — although in late years the people of Germany are coming to take greater interest in politics and to ask for a greater share in managing the affairs of the nation.

Care in Making Laws. — German laws are usually planned and framed with great care by learned men who are masters in the field of knowledge to which the law applies. German legislators seldom make a law without careful previous investigation into all matters pertaining to it. They are frequently assisted by university professors,

A trading post in German East Africa.

scientists, and men of large business experience. Public duties are executed with the same care; and officials take great pride in their positions of trust. Office holders are usually men of middle age who have broad experience. Many are of the land-owning nobility or of the capitalist class, and some serve without salary.

German Suffrage. — The right to vote has been greatly extended. Formerly, serfs had no political privileges. The ballot could be used only by freemen. Little by little, one class of society after another acquired at least partial voting power, but the right of universal equal suffrage, such as American men enjoy, is still unknown. Needless to say, the women do not vote at all.

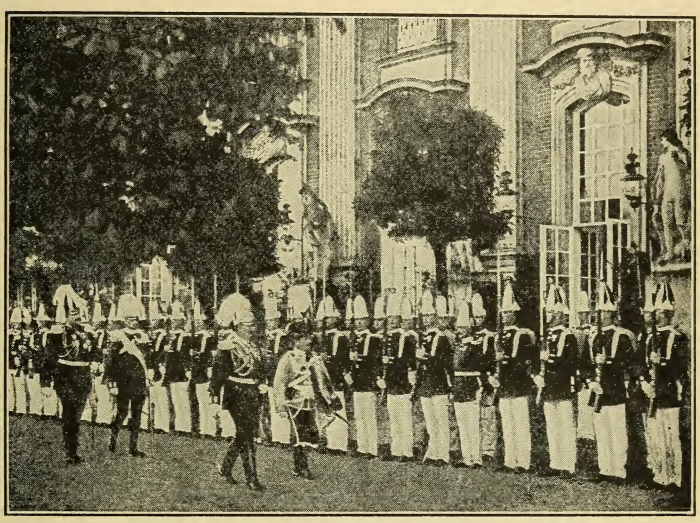
Colonial Possessions. — When in 1884 Germany began to realize her overcrowded condition, she studied the map of the world for unclaimed land. But it was too late. The best places had already been taken by England and France. She, however, acquired colonial possessions in Africa — Togoland, Kamerun, German Southwest Africa, and German East Africa. These colonies lie mostly in the tropical regions, and are not very satisfactory. German colonists accustomed to the temperate zone do not fare well in torrid regions. Nevertheless, the government encouraged the development of these colonies as a source of supply for the mother country. The imports from them into Germany are rubber, palm oil, cotton, and cattle. The exports from the mother country to her African colonies are textiles, ironware, and tobacco.

In 1898, Germany secured a ninety-nine years' lease of Kiauchau Bay on the east Chinese coast, with special commercial privileges in the adjoining province. This gave her a valuable trading post on the Asiatic coast of the

Pacific. She hoped in time to have it rival the English station, Hong Kong. In recent years Germany also acquired a number of islands in the Pacific.

The German colonies were seized by the Allies in the Great War, and their destiny depends on the result of that war.

The German Army. — Ever since the founding of the



German soldiers.

new empire (1871), Prussia has had dreams of further expansion. William II has used every possible means of extending the power of Germany on land and sea. His most effective tool for realizing this purpose has been the army. Neither money nor any consideration of individual welfare has deterred the Kaiser from building up the great weapon of militarism which has lately brought so much sorrow and suffering to the world. More than twenty

nations were plunged into war because the Kaiser's fanatical patriotism blinded him to the demands of international rights and general human justice.

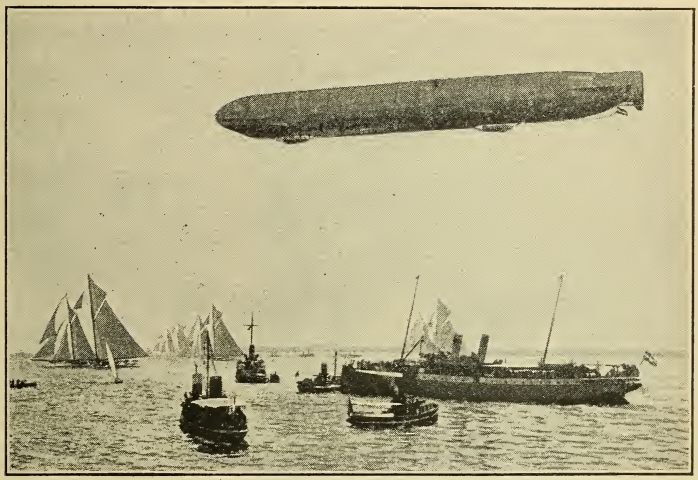
The German army, the strongest in the world, numbering millions of men, are by compulsion totally submissive to the Kaiser. For years the German people have been taught that implicit obedience to authority for the glory

Making cannons, Krupp works, Germany.

of the State as the rulers see it, is the chief virtue of the masses. Several times the Emperor has addressed the army thus: "Your duty demands of you self-control and self-denial; also unlimited obedience and submission to the will of your superiors." . . . "As I, Emperor and ruler, devote the whole of my actions and ambitions to the Fatherland, so you must devote your whole life to me."

Germany makes a scientific business of being prepared

for war. Her standing army in time of peace, including infantry, artillery, special railway and train forces, is the strongest in the world, numbering over 600,000. She keeps her soldiers thoroughly trained and looks carefully after their health. In time of war, soldiers can be transported at short notice from any part of the country to the fortifications by the railroads which are controlled by the

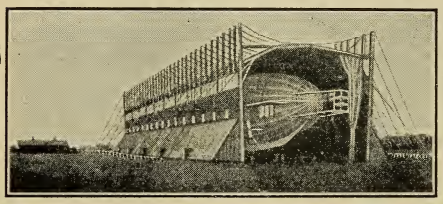


A Zeppelin, a German war balloon.

government. As soon as there is the least indication of trouble with any country, every officer receives sealed instructions as to just what he is to do in case of a declaration of war. All the railway agents receive similar envelopes with orders as to the number of trains that must be ready for the soldiers at specified stations. When war is declared, the envelopes are opened and the directions are promptly obeyed. Secret underground telegraphs connect Berlin and the various state capitals with the fortresses.

Every able-bodied youth must serve one or two years in the regular standing army. In time of war the government can draft into service every normal man between the ages of seventeen and forty-five. Formerly there was considerable rebellion against this compulsory service, and many fine young men emigrated to America to avoid it.

The German Navy. — In order to increase aggressively her trading interests, which she has in every continent, Germany built a well-equipped navy, similar to that of England. Within a few years she has worked vigorously, building three dreadnaughts a year. Until recently she occupied the fourth place among the world's navies; but now her navy ranks second, having surpassed the United States and France since 1910.

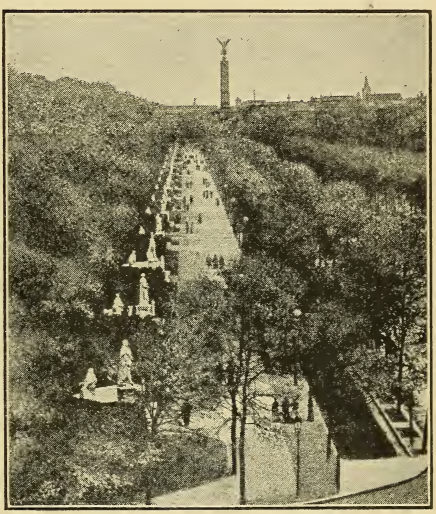


A Zeppelin in shed.

Home Life. — Probably there is no nation in which home life is dearer to the people than it is in Germany. The happiest hours are those which parents and children spend together. Germany was the first home of the Christmas tree, and the Christmas season is made much of, in giving joy to others. The members of the family remember one another with loving presents. While there are many toys, there are also useful presents. The children usually give their parents the presents which they call gifts of talents. This is a pleasant custom of giving parents pleasure through the use of some new power which the child has gained during the year. Even the smallest member of the family can do something. The little girls play fairy

tale tableaus of Cinderella or Red Riding Hood; or they give mother a new ironholder which they sewed themselves, or read an interesting story to father. One of the sons may play a new selection on the piano, another an air on the violin. Perhaps one of the daughters will recite a beautiful poem. These gifts of talent are more appreciated by the parents than presents bought with money.

Recreations.— The many art galleries and museums afford profitable recreation on Sundays and holidays. The low priced but excellent plays, operas, and concerts contribute to the general enjoyment. In winter the skating ponds are visited by young and old. In spring, summer, and autumn every one goes walking and spends many half holidays with nature. Countless happy hours are spent in city parks.



A park in Berlin.

For a long time Germany has been noted for her poetry and music. Many of her poems and songs have been translated into other languages, and appear in our readers and song books. Such names as Schubert, Beethoven, Wagner, Goethe, and Schiller are familiar to most of us. Few nations love singing as do the Germans. It is no un-

common thing for men who happen to meet at an inn or a restaurant to while away the evening by singing for an hour or more. Goethe, the German poet, once said that one should read a beautiful poem, sing a fine song, look at a good picture, or listen to sweet music every day. Many of his countrymen follow his advice.

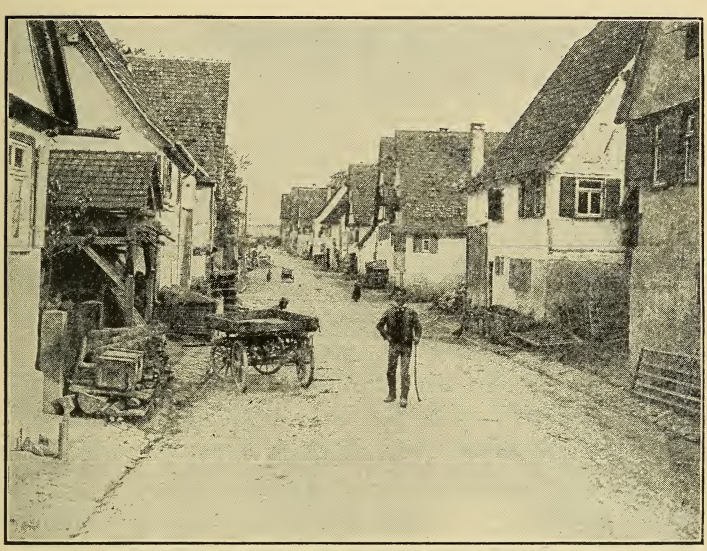
Material Welfare of the People. — The industrial progress in Germany has brought improvement in the material conditions of the German people. To a large extent, men are allowed to choose the occupations they desire. There is more wealth, and the people enjoy greater physical comforts than before. Sanitary regulations have made cities, factories, and houses more healthful; and labor laws carefully protect the life and the strength of the toilers.

Accumulated Capital. — Industrial progress has given Germany great accumulated capital. In 1850 she had to borrow money to develop home industries. To-day, she has great sums invested in foreign securities and enterprises. Factories, farms, mines, warehouses, and schools under German control are scattered widely in many foreign lands.

Wages. — The wages of German workers have increased more rapidly than the cost of living has risen. As a result there has been greater comfort and less emigration. All classes in Germany, including the lowliest laborers, enjoy daily comforts which years ago were not even dreamed of as luxuries. The homes are more comfortable. Substantial brick or stone houses, well lighted and heated, are taking the place of poorly ventilated wooden structures of by-gone days. The wages among the working classes are rather low and rather evenly distributed; hence, even the most prosperous among them are not as well-to-do as

the same class of people are in England or America. Germany might be called the land of average well-being among workmen; for, generally speaking, both the very poor and the very well paid are missing.

Working Hours and Workingmen's Insurance. — The German laborers work ten hours a day, while those of the



German workingmen's cottages.

United States work only eight; but the former work more slowly, have a longer noon intermission, besides a short rest in the middle of each half day. Machinery is not run at such high pressure or so continuously as with us. The work is less tense and more steady. Insurance laws protect the working classes in sickness, accidents, and old age. Every wage earner must carry an insurance as soon as he begins to earn a living. He pays a part of

the premiums, the government gives some aid, and the employers are compelled to meet part of the insurance expenses.

Factory Conditions. — Every employer must run his factory strictly according to the law, which requires cleanliness and sanitary conditions, good light, and pure air. Oftentimes shower baths are provided, or at least basins where the face and hands may be washed before the workman leaves for home. Where very dirty work is required, opportunity is given to change the clothing mornings and evenings. Every factory must post the rules of the house in a conspicuous place where the factory inspector who comes around at regular intervals can see them. This schedule includes among other things the hours of labor, the mealtimes, time and manner of paying wages, punishments, and fines. The inspector sees that these rules are according to the law and that they are properly obeyed.

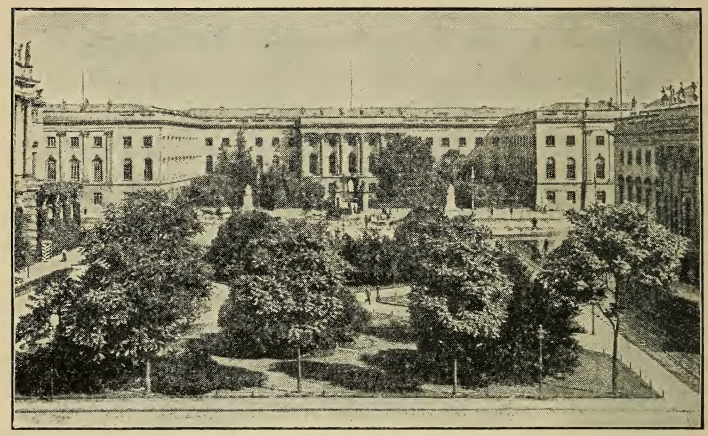
The Labor of Women and Children. — The health of a nation depends so much upon the women and children that special provisions are made for them, although the women have to do much more work than in our country. No woman is allowed to work in a factory at night. Children under thirteen cannot be employed at all; and after that, only for a limited number of hours, ranging from six to ten per day, according to the age.

Public Provisions for General Welfare. — The state and city authorities give the greatest attention to good water supply, the proper disposal of garbage and sewage, the cleaning and lighting of streets, and the checking of disease. Many provisions are made for the comfort of the helpless and defectives. Public parks and museums are agencies for promoting the health and happiness of the

people. The crowding of many families into the tenement houses of the factory towns is detrimental to public welfare. To overcome this difficulty, various government authorities have, within recent years, helped to build good sanitary houses for workingmen. These are sold at reasonable prices, on long-time payments, and at low interest rates. Provisions are also made to loan money on very easy terms to capable young farmers that they may get proper tools, animals, and fertilizers. Such things help to produce a happier and better race of people; but the question arises as to whether the Kaiser is not merely using these means to produce a stronger fighting force in order to realize his ambition.

Education. — For over a hundred years this nation has given much attention to educating her people. After a serious defeat of Prussia by the French in 1806, King Frederick Wilhelm said: "The state must regain by intellectual power what she has lost in material power, and to this end I desire that everything may be done to extend and perfect the education of the people." Great statesmen, philosophers, and educators labored unceasingly during the dark hours of Germany's history to impress the people with the fact that their future success could be assured only through a thorough training of the youth of all classes. After the victory of 1871, the nation again put its best energies into educating the young people in the practical arts. Besides the common and high schools, and the universities, schools were established for the teaching of almost every trade. The boys and girls who leave school at fourteen years of age must attend a continuation school several hours a week, usually after working hours; that is, after supper or on Sunday morning, to learn more about German composi-

tion, reading, arithmetic, and mechanical drawing. They also study physics, chemistry, simple mechanics, civics, hygiene, and a little about the laws relating to the various industries.



Buildings of the University of Berlin.

In commercial schools they learn business correspondence, how to write checks, postal money orders, receipts, bills of lading, and telegrams. Bookkeeping and commercial geography are also studied. Some of the special trade schools are those for printers, metal and leather workers, builders, tailors, farmers, and dentists. Cooking, stenography, bookkeeping, sewing, and millinery are taught in girls' schools. Besides the textile or cloth-weaving schools there are those that teach knitting, engineering, mining, navigation, and shipbuilding. Advanced high schools educate the managers of factories and steamship companies, the heads of museums, wholesale merchants, and representatives to foreign countries; in short, all captains

of industry. The highest type of school trains the ablest men to discover new chemical products, or improved methods in industry.

Commercial Geography. — The study of commercial geography receives much attention. The Germans learn much about the products of other nations and their needs. They investigate the possibilities of opening up trade relations with foreigners, and are quick to seize the opportunity of increasing their own business. Museums of the products and other material wealth of foreign countries are scattered all over Germany. Other museums contain exhibits of workmanship in metals, wood, clay, cloth, and glass. These are really schools of instruction for all classes of artists and artisans.

Study of Foreign Languages. — German students learn three or four languages. Traveling salesmen make a point of offering their goods to foreigners in the native tongue of the customers. This pleases buyers and increases sales. Another advantage of a knowledge of foreign languages is that it enables Germans to read the trade papers of their rivals.

The World War. — In June, 1914, a Serbian subject of Austria murdered Archduke Francis Ferdinand, heir to the Austrian throne. For this Austria made several demands upon Serbia which no self-respecting nation could grant. Austria then declared war upon Serbia. Russia joined Serbia in her defense against Austria. Germany presumably felt herself honor bound to help her ally, Austria. As the war has progressed, however, it has become quite evident that the German Kaiser considered it an opportune time for pushing his ambitions and that a possible point of honor was used as a pretext for plunging the nations into

war. No doubt it was under his instructions that Austria took the fatal step.

The German armies, in defiance of international law and neutral rights, marched through Belgium to invade France, the ally of Russia. This violation of neutrality was naturally resented, but Belgium in her weakness was practically crushed by the invading armies. England, virtually an ally of France, and protector of helpless neutrals, then entered the war, because she was vitally interested in the independence of Belgium and France. In time, Turkey and Bulgaria threw in their lot with the Central Powers, Germany and Austria; while Japan and Italy joined England, France, and Russia, known as the Allies.

As the war progressed, Germany, determined at all hazards to gain control of the ocean, carried on war in such ruthless manner that not only her avowed enemies suffered, but all neutral rights, wherever they stood in the Kaiser's way, were outraged. Thus, through her submarine attacks on American ships and shameless wrongs committed by authorized German spies upon the life and welfare of the American people, the United States was forced, on April 6, 1917, to declare that a state of war existed between Germany and our country. Several other countries also took up the cudgels against Germany, or at least broke off friendly relations with her.

Thus has one of the most promising lands on earth, because of an insatiable desire to dominate the world, made of that world her bitter enemies. Before June, 1914, Germany had an unusually bright future ahead of her; now the outlook for her is gloomy indeed. Her foreign commerce is ruined, and the tremendous expenses of the war have brought her to the verge of bankruptcy; worse

than all, her disregard of treaties and of international law have left a terrible legacy of suspicion and distrust.

Professor J. Holland Rose, of the University of Cambridge, England, in "Origins of the War," offers one extenuating cause for Germany's resorting to this war. He says, "When the war is over, it is to be hoped that Germany will discover that international law, on which she has insanely trampled, may prove to be her safest support. For when the din of war dies down, we shall read that behind the lust of conquest there was an elemental force impelling the German people forward. Their population is ever increasing; and they must have more elbow-room in some of the sparsely inhabited lands. On this occasion they have sought the disastrously wrong method of war.

"Today there is a Supreme Court of Appeal for Nations, the Hague Tribunal. The wiser and better course for Germany would have been to seek to enlarge its powers so as to include the consideration of her important vital problem, and the adoption of some scheme which promised a peaceful solution.

"In the course of reaction in favor of international law, the Hague Tribunal will surely acquire an added dignity, a wider scope, and surer guaranties in the discharge of its beneficent functions. . . .

"The enlarged and strengthened Areopagus of the nations must and will discuss such questions as the excessive pressure of population in one state, and it will seek to direct the surplus to waste or ill-cultivated lands. In that more intelligent and peaceful future Germans will not need to 'hack their way through.'"

Conclusion. — Germany attained its industrial preëminence through the most strenuous efforts of labor on the

part of every one from the Kaiser down to the humblest citizen, and through untiring scientific research on the part of her learned men. The Kaiser's ambition developed in his people a storm of unparalleled patriotic fervor, and plunged the nation into a World War, which will seriously handicap her for years.

The enmity which the Kaiser has brought down upon Germany, and the check to her commercial development, have blighted many German industries. No one can tell how long a period will be required for reëstablishing the commercial achievements that were gained during the first fifty years of the new empire, and were lost by the folly of 1914. The World War clearly demonstrates the dependence of industrial prosperity upon international righteousness and clear spiritual vision.

Questions and Exercises

1. Discuss the causes and the effects of the Great War that began in 1914.

2. The Germans think that a ten-hour working day, with three intermissions and especially a long noon rest, is better for promoting health than an eight-hour day, with only one short midday recess. What do you think about it?

3. What does the home life have to do with the greatness of a nation?

4. In what way is the love of outdoor life among a people a national advantage?

5. Germany has regularly withdrawn several hundred thousand young men annually from the industrial ranks in order to have a large standing army. Discuss the advantages and disadvantages of such an arrangement to the nation and to the individuals.

6. In what ways is the government of Germany like that of the United States? In what important ways is it different?

7. What to your mind is the greatest cause of Germany's remarkable progress in the last fifty years?

8. What have the wages of workingmen to do with the conservation of human life?

9. Why have Germans not settled extensively in the colonial possessions of Germany?

10. How does Germany prepare her young men for a commercial career?

The United States
is the industrial peer of
the German and British Empires:
What causes have contributed to her
rapid development, and along
what lines has this advance-
ment been made?

THE YOUNG INDUSTRIAL GIANT OF THE WEST

OUR OWN NATIONAL DEVELOPMENT

Within four centuries the United States has been changed from an unknown wilderness into one of the three leading powers, holding an honorable place by the side of much older nations. After the discovery of America more than a century elapsed before a permanent English settlement was made. More than another hundred years passed before the last of the original thirteen colonies was established. Not until 1776 did the United States become independent. Hence our wonderful development has been achieved in less than one hundred fifty years of national existence.

We have accomplished much in a short time. But we must not forget that we owe no little part of this rapid development to our inheritance from older nations. The experience of their European ancestors served to guide our forefathers in the formation and establishment of our government. Our schools and churches are offshoots of tried systems. The inventions of the Old World were early applied to American industries. Our language, the most powerful factor in welding our national unity, came from beyond the Atlantic. Ours has been the combined heritage of all the civilizations that have preceded us.

120°
110°
100°
50°
40°
30°
DOMINION
Vancouver
Victoria
C. Flattery
Puget Sound
Everett
Seattle
Spokane
Olympia
Tacoma
WASHINGTON
Portland
Columbia
Salem
OREGON
Snake R.
Coeur d'Alene
Great Falls
MONTANA
Missoula
Helena
Butte
Missouri R.
Yellowstone
YELLOWSTONE NAT'L PARK
Sheridan
Boise
Pocatello
WYOMING
Cheyenne
Grand Forks
NORTH DAKOTA
Bismarck
Aberdeen
SOUTH DAKOTA
Lead
Pierre
Sioux Falls
Missouri
NEBRASKA
Council Blu
Omaha
Lincoln
Platte R.
Red R.
C. Mendocino
CALIFORNIA
Sacramento R.
Oakland
Sacramento
Stockton
San Francisco
San Jose
Fresno
Los Angeles
San Diego
NEVADA
Carson City
Goldfield
UTAH
Great Salt Lake
Ogden
Salt Lake City
Grand Canyon
Colorado
ARIZONA
Phoenix
Tucson
COLORADO
Denver
Colorado Sprs.
Pueblo
Trinidad
KANSAS
Hutchinson
Wichi
Arkansas
Topek
NEW MEXICO
Santa Fe
Albuquerque
Roswell
Rio Grande
Pecos
Juarez
El Paso
Oklahoma Cy.
Muskoge
OKLAHOM
Canadian
Amarillo
Red
Brazos
Denison
Ft. Worth
Dal
Waco
TEXAS
Austin
San Antonio
Rio Grande
Nuevo Laredo
Laredo
Brownsvi
Matamoros
Monterey
Torreon
Topolobampo
Guaymas
Chihuahua
MEXICO
LOWER CALIFORNIA
GULF OF CALIFORNIA
TROPIC OF CANCER
Mazatlan
PACIFIC OCEAN
L.L. POATES CO., N.Y.
110°
Longitude
100°
Wes

90°
80°
70°
40°
30°
Albany R.
Lake of the Woods
Port Arthur
Duluth
Superior
Minneapolis
St. Paul
St. Cloud
Winona
La Crosse
Oshkosh
Milwaukee
Madison
Racine
Dubuque
Davenport
Rock Island
Peoria
Burlington
Chicago
South Bend
Ft. Wayne
Toledo
Cleveland
Detroit
Lansing
Saginaw
Grand Rapids
Sudbury
Ottawa
Toronto
Niagara Falls
Buffalo
Erie
Rochester
Syracuse
Albany
Montreal
Quebec
St. Lawrence R.
Burlington
Montpelier
Rutland
Concord
Manchester
Portland
Augusta
Bangor
Lewiston
Boston
Providence
Hartford
New Haven
New York
Newark
Trenton
Philadelphia
Wilmington
Dover
Scranton
Pittsburgh
Reading
Harrisburg
Wheeling
Cumberland
Baltimore
Annapolis
Washington
Richmond
Norfolk
Lynchburg
Roanoke
Parkersburg
Charleston
Ashland
Cincinnati
Columbus
Indianapolis
Springfield
Terre Haute
Evansville
Covington
Frankfort
Lexington
Louisville
Hannibal
St. Joseph
Kansas City
St. Louis
E. St. Louis
Jefferson City
Cairo
Joplin
Springfield
Knoxville
Nashville
Memphis
Jackson
Chattanooga
Shevenc
Raleigh
Charlotte
C. Hatteras
Wilmington
Columbia
Spartanburg
Atlanta
Augusta
Macon
Charleston
Savannah
Birmingham
Montgomery
Meridian
Vicksburg
Jackson
Shreveport
Texarkana
Little Rock
Ft. Smith
Mobile
Tallahassee
Pensacola
Jacksonville
Baton Rouge
New Orleans
Lake Charles
Galveston
Tampa
Miami
Key West
C. Sable
Nassau
BAHAMA ISLANDS
Havana
CUBA
GULF OF MEXICO
ATLANTIC OCEAN
Florida Strait
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
St. Marys R. and Canal
Niagara Falls
Ohio
Tennessee
Mississippi
Illinois
Wabash
Red
Arkansas
Missouri
Kansas
Iowa
Minnesota
Wisconsin
Michigan
Indiana
Illinois
Ohio
Kentucky
Tennessee
Mississippi
Alabama
Georgia
Florida
South Carolina
North Carolina
Virginia
West Virginia
Pennsylvania
New York
Maine
Vermont
New Hampshire
Massachusetts
Connecticut
Rhode Island
New Jersey
Delaware
Maryland
Louisiana
Texas
Arkansas
Missouri
Kansas
Iowa
Nebraska

POLITICAL MAP
OF THE
UNITED STATES
SCALE OF MILES
0 100 200 300 400 500
DOMINION OF CANADA
Vancouver
Victoria
Winnipeg
Lake Winnipeg
Seattle
Tacoma
Spokane
Portland
Salem
Olympia
Everett
Coeur d'Alene
Great Falls
Missoula
Helena
Butte
Grand Forks
Bismarck
Fargo
Aberdeen
Pierre
Lead
Sioux Falls
Sioux City
Omaha
Council Bluffs
Lincoln
Boise
Pocatello
Cheyenne
Denver
Colorado Spgs.
Pueblo
Trinidad
Topeka
Wichita
Hutchinson
Salt Lake City
Ogden
Carson City
Sacramento
Stockton
San Francisco
San Jose
Oakland
Goldfield
Fresno
Los Angeles
San Diego
Santa Fe
Albuquerque
Roswell
Amarillo
Oklahoma Cy.
Phoenix
Tucson
El Paso
Ft. Worth
Dallas
Waco
Austin
San Antonio
Denison
Galveston
Houston
Beaumont
Baton Rouge
New Orleans
Mobile
Pensacola
Tallahassee
Jacksonville
Tampa
Key West
Havana
Nassau
Miami
Chihuahua
Guaymas
Nuevo Laredo
Laredo
Brownsville
Matamoros
Monterey
Topolobampo
Torreon
Mazatlan
TROPIC OF CANCER
Minneapolis
St. Paul
St. Cloud
Winona
La Crosse
Oshkosh
Milwaukee
Madison
Racine
Chicago
Dubuque
Davenport
Des Moines
Rock Island
Burlington
Peoria
Ft. Wayne
South Bend
Detroit
Toledo
Cleveland
Lansing
Grand Rapids
Saginaw
Port Arthur
Lake of the Woods
Sudbury
Ottawa
Toronto
Buffalo
Rochester
Syracuse
Albany
Erie
Scranton
Pittsburgh
Harrisburg
Reading
Philadelphia
Trenton
Wheeling
Baltimore
Washington
Richmond
Norfolk
Lynchburg
Petersburg
Charleston
Parkersburg
Huntington
Cincinnati
Columbus
Indianapolis
Terre Haute
Springfield
Hannibal
St. Joseph
Kansas City
St. Louis
Jefferson City
Evansville
Frankfort
Lexington
Louisville
Covington
Springfield
Cairo
Joplin
Nashville
Knoxville
Chattanooga
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Savannah
Columbia
Spartanburg
Charlotte
Raleigh
Wilmington
Greensboro
Albany
Montreal
Quebec
Burlington
Montpelier
Concord
Manchester
Portland
Boston
Providence
Hartford
New Haven
New York
Newark
Trenton
Philadelphia
Wilmington
Dover
Baltimore
Washington
Richmond
Norfolk
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Savannah
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Pensacola
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Parkersburg
Huntington
Cincinnati
Columbus
Indianapolis
Terre Haute
Springfield
Hannibal
St. Joseph
Kansas City
St. Louis
Jefferson City
Evansville
Frankfort
Lexington
Louisville
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Macon

CHAPTER XII

NATURAL ASSETS OF THE UNITED STATES

Favorable geographic conditions have had much to do with the growth and prosperity of the United States. Some of the chief geographic factors are advantageous location, fertile soil, rich mineral supply, favorable climate, excellent waterways, and extensive forests.

Position and Size. — An important factor in the progress of the United States is its position directly opposite the most highly developed continent, separated from it by only 3000 miles of the Atlantic. Our country is much nearer to Europe than to any other continent of the Old World. When the United States became independent in 1776 it extended from the Atlantic Ocean to the Mississippi River and from Canada to Florida. Strip after strip was added to it until to-day it extends from the Atlantic to the Pacific and covers more than 3,000,000 square miles. It is larger than Australia and little smaller than Europe. It is so broad from north to south that the fastest trains require about thirty-six hours to cover the distance. It is so long from the Atlantic to the Pacific that the speediest trains cannot cross it in less than eighty-four hours.

Coastline. — North America ranks next to Europe in irregularity of coast, and the United States has over 3000 miles of coastline. There are many excellent harbors. Most of them border on the Atlantic, which is the greatest highway of trade. Others are on the Pacific, which may some day rival the Atlantic in commerce. Fortunately all our seaports are ice-free the year round.

Surface. — From east to west, the United States is divided into four great natural regions. Along the Atlantic is a belt of lowland called the Atlantic Coast Plain. Farther west is the Appalachian Highland, and in the central part of the country is the Central Plain. The western third of the United States is the Cordilleran Highland.

Farm land in the Atlantic Coast Plain.

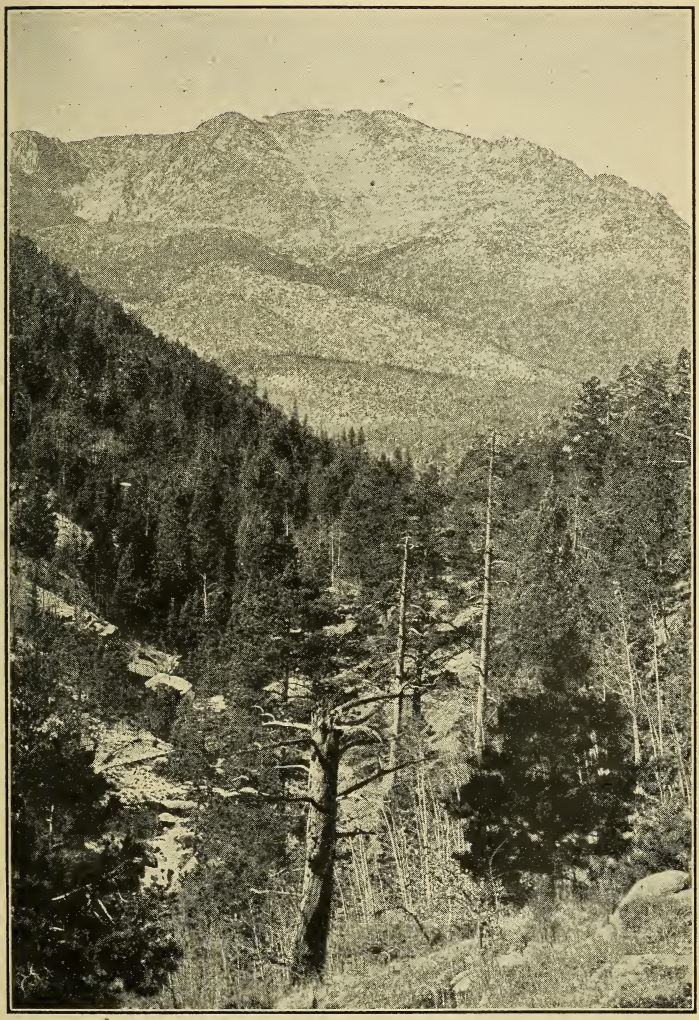
Atlantic Coast Plain. — The Atlantic Coast Plain begins at Cape Cod and extends to Florida. At the northern end it is only a few miles wide, but it widens southward so that in Georgia it is about 300 miles wide. The coast plain bordering the Gulf of Mexico is called the Gulf Coast Plain.

Appalachian Highland. — The Appalachian Highland extends from Newfoundland and the St. Lawrence River to northern Alabama and Georgia. The New England Plateau is part of this highland region. Just west of the Atlantic Coast Plain is a plateau belt called the Piedmont Plateau. This is the southeastern part of the Appalachian Highland. At the eastern edge of the Piedmont belt the surface slopes steeply down to the Atlantic Coast Plain, and because of the falls and rapids in the streams this

steep slope is called the Fall Line. West of the Piedmont Plateau is the belt of Appalachian ridges and intervening valleys. The western slope of the Appalachian Highland is called the Appalachian Plateau, which is divided into a northern portion, called the Allegheny Plateau, and a southern part, called the Cumberland Plateau.

Central Plain. — The broad lowland between the Appalachian and Cordilleran highlands is the Central Plain. This extensive region includes the Glacial Drift Plain in the northern part, the Gulf Coast Plain in the southern part, and the Great Plains, or High Plains, in the western part. The greatest river system and the largest lakes in the world are found in the Central Plain.

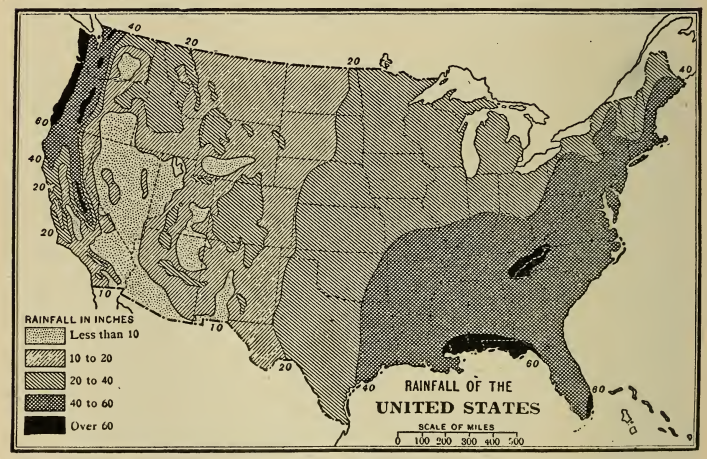
Cordilleran Highland. — The Cordilleran Highland is divided into three main divisions. The eastern part is the Rocky Mountains; the western part is the Pacific Ranges, which include the Coast Ranges, Sierra Nevada, and Cascade Mountains; the middle part, lying between the Rocky Mountains and the Pacific Ranges, is a wide belt of high plateaus. Beginning at the north, these are the Columbia Plateau, the Great Basin, which is really a high plateau, and the Colorado Plateau. The Coast Ranges lie so near the Pacific Ocean that there is scarcely a plain along the coast. Between the Sierra Nevada and Cascade Mountains on the east and the Coast Ranges on the west is a narrow belt of lowland that is almost continuous from Mexico to Canada. The southern part, called the Great Valley of California, is made up of the valleys of the San Joaquin and Sacramento rivers. The northern part of this lowland is the Willamette valley and the basin of Puget Sound.



A view of Pikes Peak, Colorado.

Climate. — The United States lies in the warm part of the temperate zone. In the southern part of the country, the summers are long and hot, and the winters are short, with only a very few days of freezing weather. In the northern part of the United States, the winters are long and very cold. The east and west coasts have a milder climate than the central part of the country, where the winters are quite cold and the summers hot.

The eastern half of the United States has ample rain, which comes from the Gulf of Mexico and the Atlantic



Ocean. The greater portion of the western half does not have sufficient rain, and is either arid or semiarid. Narrow belts on the western slopes of the Pacific Ranges have abundant rainfall; and the region of greatest rainfall in the United States is the western slope of the Coast Ranges in Washington and Oregon. As the moist air of the prevailing winds from the Pacific strike the mountain ranges

much of the moisture falls as rain or snow. The eastern slopes of these mountains and the plateau belt to the east are quite dry. Although the Rocky Mountains are far from the Pacific, yet considerable moisture falls upon their windward slopes, thus forming another rainfall belt. The eastern slopes of the Rockies and the High Plains are semi-arid, for they are cut off from the moisture coming from the Pacific, and they are too far from the sources of the rain that falls in eastern United States to profit therefrom.

Natural Resources. — The soil is by far our greatest natural resource. The large areas of fertile land with enough warmth and rain for crops make the United States one of the most productive nations. The Atlantic Coast Plain, the Gulf Coast Plain, and the Glacial Drift Plain are the most extensive agricultural sections of the country. Not only the deep soil, but the climate and level surface give them their agricultural prominence.

The mountainous regions of the United States are the chief mining districts. In the Appalachians are great deposits of coal, iron, and building stone. The richest mines of iron, however, are in the hilly district south and west of Lake Superior; and there are extensive deposits of coal in the Central Plain. In the Cordilleran Highland are rich mines of gold, silver, and copper.

Great forest areas exist in the Appalachian Mountains, Rocky Mountains, and Pacific Ranges. Our most valuable forests are on the rainy slopes of the Coast Ranges, the Cascade Mountains, and the Sierra Nevada. These slopes have also the largest amount of water power for manufacturing purposes. Another valuable forest region is in the Gulf Coast Plain. The coniferous forests near Lake Superior still furnish large quantities of lumber.

Conclusion. — No country is blessed with greater natural wealth than the United States. The extensive plains, with favorable soil and climate; the great mineral wealth, especially the abundance of coal and iron; the deep waterways and swift streams that furnish power; and the valuable forests of mountains and plains all form the physical basis for the great wealth and industrial progress of the United States.

Questions and Exercises

1. Sketch an outline map of the United States, showing the irregular coasts. Name at least a dozen indentations. Indicate the four great natural regions. On your sketch name all the parts of each that are mentioned in this chapter. In which region do you live?
2. Why have the coasts milder climate than the interior?
3. What is the annual rainfall in your part of the country?
4. Make a careful study of a daily weather map of the United States.
5. What are the chief natural resources of your state?
6. On your own map indicate the sections where the principal natural resources of the country are found.

CHAPTER XIII

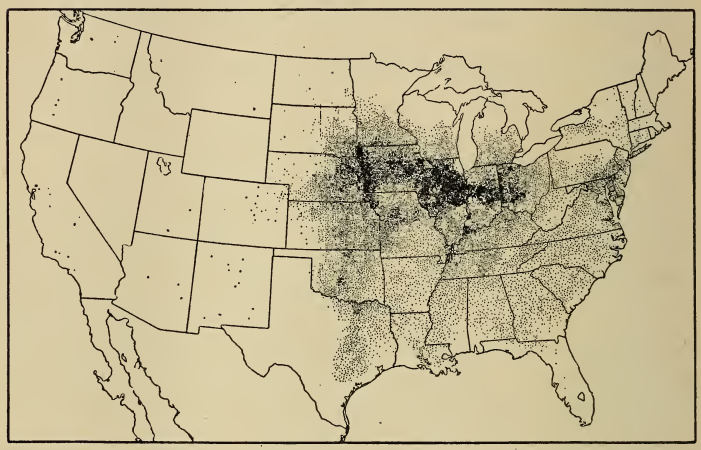
FIELD CROPS OF THE UNITED STATES

General Agricultural Conditions. — Because of the natural advantages of soil, surface, and climate, together with the good management of farms, agriculture is a source of more wealth to the United States than any other industry. The extensive areas of fertile land with ample heat and rainfall make possible large acreage of crops and high yields per acre. Improved machinery is greatly reducing human labor on the farm and better methods of farming are producing larger crops and at the same time keeping up the fertility of the soil. We raise a great variety of crops, yet the three leading ones, corn, cotton, and wheat, are worth about one half of the total value of all crops. In the production of these three, the United States leads all other countries.

Field Crops. — The crops that are generally raised in fields, as distinct from orchards, gardens, and forests, are called field crops. These crops far exceed all the others in acreage and value. The most important field crops are corn, cotton, hay and other forage, wheat, oats, tobacco, barley, flax, sugar cane, rye, sugar beets, and rice.

Corn. — To-day corn easily leads as our largest and most valuable crop. No country rivals the United States in its production. It produces four fifths of the world's supply. The belt of highest corn yield is in the Central States, including Illinois, Iowa, Kansas, Nebraska, Missouri, Oklahoma, Texas, Indiana, Ohio, and Kentucky. At the present time the average yield per acre is nearly thirty

bushels. Great attention is being given to soils, seed selection, and methods of cultivation in order to increase this yield. It is possible to double the average production per acre with but little extra work and expense.



Distribution of corn in the United States. One dot equals 100,000 bushels.

Rainfall and temperature have much to do with the yield of corn. It is planted in the spring just as soon as danger of frost is over, and it usually matures before a killing frost of autumn. Sometimes, however, an early frost damages the corn. The most common cause of a low yield is a scarcity of rain during the months of June, July, and August. The growing crop is cultivated several times to loosen the ground, kill the weeds, and to make a mulch of fine soil that prevents the rapid evaporation of soil moisture. Much of the corn is harvested by cutting the stalks, either by hand or by a corn harvester, and placing them in shocks in the field until the grain is dry and hard.

Then the shocks are hauled to the barn yard, where a corn shredder husks the ears of corn and cuts the stalks and leaves into small lengths for fodder. Much of the corn, however, is husked from the standing stalks, whose leaves and husks furnish winter pasture for cattle and horses.

Corn is used as food by man and animals. In the United States the greater part is fed to horses, cattle, hogs, and poultry on the farms where this grain is grown.

Corn meal, breakfast foods, hominy, canned corn, corn-starch, and glucose are important foods made from the grain. Corn oil, made from the germs of the grains, is used for lubricants, and in the manufacture of soap. The cobs are used mainly for fuel. In addition to these, a

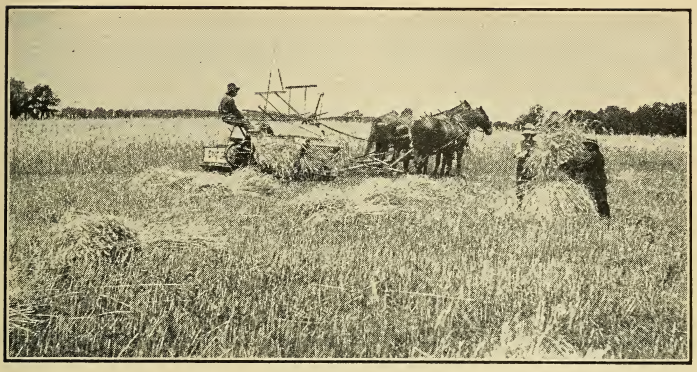
Husking corn.

number of other products are obtained from the corn plant.

Wheat. — Next to corn, wheat is our most valuable food crop. Because of the large area of wheat lands the United States ranks as the greatest producer of this cereal. The slightly rolling land and the fertile soil of the North Central section, as well as the rich valleys of California and the Columbia River region, are well adapted to its production. The leading wheat states are: North Dakota, Kansas, Minnesota, South Dakota, Nebraska, Illinois, Washington, Indiana, Missouri, and Ohio. Wheat requires dry sunny days during its ripening period, and therefore it does not grow well in regions of moist summers. It thrives in a cooler climate than corn does, hence its northern limit reaches far beyond the corn belt.

The enormous acreage and yield of wheat has been made possible by the improvement of farm machinery. The

Wheat-growing areas and chief flour-milling centers of the United States.



Harvesting wheat.

harvester, which cuts and binds the wheat, and the thresher, which separates the grain from the chaff and straw, are the most important machines. In regions where farms are measured by thousands of acres the ground is plowed by large plows drawn by traction engines. The old-time farmer stored his few bushels of wheat in his bins, and had it ground into flour at the little neighborhood mill, as he needed it for family use. The modern farmer raises for commercial purposes far more than he can conveniently house. After the harvests vast quantities of grain are transported to immense elevators to wait for shipment. Instead of sacking wheat, as formerly, it is stored and shipped in bulk. This saves time, labor, and expense.

A large amount of wheat finds its way to the mills of Minneapolis, Chicago, and St. Louis, where it is ground into flour and shipped to many domestic and foreign markets. Thousands of bushels of American wheat take a voyage down the Great Lakes through the Erie Canal and Hudson

River, across the Atlantic into Europe. Since wheat bread is the staff of life among nearly all the white race in Europe, Africa, Australia, and America, we are fortunate in being able to produce so much of the world's supply.

Wheat has other products besides flour. Some of the grain is turned into starch, macaroni, and breakfast foods. The straw is used for rough feed, stable bedding, manufactured into paper, or braided into hats, mattings, and baskets.

The average yield of wheat per acre in the United States is only about sixteen bushels, while Germany and Great Britain have about twice this yield. The cause of this great difference is that the American has given more attention to large acreage of wheat rather than to high yield per acre. These European countries with limited area cultivate the crop with the greatest skill and are careful to maintain the fertility of the soil. We are just beginning to realize the need of intensive cultivation.

Oats, Barley, and Rye.—Of the grain crops, oats rank next to wheat in value. Corn lands are well adapted to oats, and the two leading corn states lead also in the production of oats. The leading wheat states also rank high in yield of oats. Although oatmeal is a good breakfast food, most of the oats is fed to stock. Barley and rye are far less important than wheat and oats. The North Central and Pacific states lead in the production of barley, Minnesota and California being the two leading states. In the West, barley largely takes the place of corn for feeding stock. With the exception of rice, rye is our smallest grain crop. The chief rye states are Wisconsin, Pennsylvania, Michigan, and Minnesota.

Rice. — Rice grows in the low river valleys and coastal plains of the Southern States, where the land can be easily flooded. Louisiana, Texas, Arkansas, and South Carolina lead in its production.

Hay and Forage. — The combined value of the hay and forage crops is surpassed only by that of corn and cotton. In the New England, Middle Atlantic, and Rocky Mountain states, hay and forage are the leading crops. This is due mainly to the fact that grass and other forage plants grow well on hilly and mountainous lands where grain crops cannot be successfully raised.

Hoeing rice, South Carolina.

The Central States, however, are the greatest producers of hay and forage, although in this section these crops are not so important as the grains.

Timothy is the most valuable hay for feeding horses and brings the highest price in the market. The acreage of timothy exceeds that of any other hay plants, although the acreage of timothy and clover mixed is greater than that of pure timothy. Clover is grown not only for hay and pasture, but also to enrich the ground.

Alfalfa promises to become one of the most profitable forage plants. At present, nearly all of the alfalfa is grown

Mowing a field of alfalfa.

in the states west of the Mississippi. It thrives best where there is abundant sunshine and good soil, and is one of the leading crops in the irrigation districts of the West. It grows readily on high mountain slopes as well as in low valleys. Its long roots enable it to thrive even in dry regions. Montana produces three harvests of alfalfa a year, while California grows five per year. Alfalfa is of special value to Western stockmen because of its great feeding value to cattle and sheep. The stacks of this hay furnish an abundance of food through the winter, and also during summer droughts. Alfalfa, like clover, increases the fertility of the soil. This enrichment of the soil in which they grow, makes these two hay crops doubly valuable to the farmers.

Cotton. — Fibers that are used in manufacturing cloth are obtained from hemp, sisal, jute, flax, cotton, and other

plants. But the cotton surpasses all others in desirable qualities; and it is becoming more and more important. Because it can be so easily cleansed cotton cloth is taking the place of wool, even in winter. Savage tribes of remote and little-known warm parts of the earth, who were formerly almost unclad, are gradually adopting cotton dress. Cotton cloth is one of the most important manufactured products of the world.

Production and Export of American Cotton. — While cotton grows in most tropical and subtropical countries, two thirds of the world's crop is harvested in our own Southern States, where the summers are warm and long, and the climate is moderately moist. The annual cotton production of these states is worth more than the world's combined gold and silver output. The leading cotton states are Texas, Georgia, Alabama, South Carolina, and Arkansas. Not only the most cotton but the best quality

Cotton-growing region and chief centers of cotton manufacture.

is produced in the United States. This is the sea-island cotton of South Carolina and Georgia, whose long, satin-like fibers make the fine threads, laces, and fabrics.

Cotton bolls.

Cotton is planted in March or April. By the middle of June the field is covered with green plants containing many beautiful flowers. The cotton ripens and the picking begins in July. The work continues until Christmas. The seeds are removed by gins, and the fiber is pressed into 500-pound bales, which are shipped to factories in the North and South and to foreign countries. Beginning with August and continuing to January, cotton is constantly being loaded on cars and sent to distributing centers, where it starts on long rail and water journeys. More than one

third of the crop remains in the United States. A third goes to Great Britain, and the rest to Germany and other North Sea countries. Northwest Europe, where no cotton is raised at all, is the great receiving market for American cotton; but India, Egypt, and Brazil also help to supply the busy European mills with raw cotton.

The large cotton-collecting stations of the west half of the cotton belt are Memphis, Montgomery, Shreveport, Vicksburg, Houston, and New Orleans. Galveston, with its fine harbor, and surrounded by the immense plantations of Texas, is the leading cotton port. Charleston, Savannah, Mobile, and Pensacola are important eastern points of export. Our total crop averages about 12,000,000 bales of 500 pounds each.

Bales of cotton.

The Enemies of Cotton. — The cotton plant has a number of enemies that cause an annual loss of millions of dollars. Due largely to pests and fungous diseases, the average yield per acre has been slightly reduced in recent years. The most important pest is the boll weevil. This weevil came into Texas from Mexico several years ago. It spread inland at the rate of about fifty miles per year, and has now reached Oklahoma and Alabama. This insect passes through four stages, — egg, worm, pupa, and adult weevil. The adult female, less than an inch long, lays during a season from three hundred to three thousand eggs on the foliage and in the bolls. The worms which hatch from the eggs eat the leaves and bolls, and the cotton within the infected bolls is destroyed. Pulling up the cotton plant in the fall and burning the roots and stalks is the most effective means of killing the weevils. A fungous disease, called cotton wilt, does considerable damage. The fungus enters the roots and causes a wilting and final death of the plants. No satisfactory method of preventing this disease has yet been discovered.

Harvesting Cotton. — The cotton bolls do not all ripen at the same time and the harvesting of cotton extends from July to December. This is the most expensive part of cotton raising, since the laborers must go over a field several times during the ripening period. Machines for picking cotton have been tried, but they have not proved very successful, hence the crop is practically all picked by hand.

After the cotton is picked it is hauled to ginning mills, where the fiber and seeds are separated. The fiber is then baled for shipment. Before the invention of the cotton gin by Eli Whitney the separation of fiber and seed was

such a slow process that only a very little cotton could be raised, as it took one man an entire day to seed one pound of cotton fiber. The cotton gin revolutionized the cotton industry and made it possible for the Southern States to help clothe men, women, and children in every quarter of the globe.

Weighing the day's picking.

Cotton Products. — When the cotton reaches the mill it is first cleaned from dirt and leaves. Then it is combed and twisted into threads and yarns. The yarns are woven into cotton cloth. Mixed goods are made by weaving cotton yarns with threads of wool or silk. The shortest bits of cotton are manufactured into wadding, cotton batting used in comforters, and absorbent cotton used for medicinal purposes. Cotton treated with acids is used to make substitutes for silk, also celluloid and certain

explosives. From the seed we get cottonseed oil and oil cake. The seeds are hulled, the kernels are ground, and the oil is pressed out by heavy machinery. The oil is used in the manufacture of soaps and candles, for lubricating purposes, and as a substitute for olive oil. The hulls are used as paper stock, cattle food, fuel, and fertilizer.

Cotton Rivals of the United States. — Next to the United States, India and Egypt are the largest producers of cotton. England is doing much to encourage the growing of cotton in these two countries and in other parts of the British Empire. Brazil and Peru raise large quantities of the long staple cotton. Good fiber is raised in central Asia and sent to Russian mills. China raises cotton and uses all of it in her own cotton mills. In other warm regions of the earth also, the problem of cotton raising is being worked out.

Flax. — Flax was introduced into this country by the early settlers of New England, who used the fiber for making clothing. About 1800, when cotton came into general use, flax began to be cultivated for the seed also. From the flaxseed is obtained the linseed oil which is used in making paints and varnishes. To-day in the United States flax is raised almost entirely for the seed. Argentina and the United States are the leading countries in the production of flaxseed. In Europe flax is raised mainly for the fiber, which is woven into linen. North Dakota, South Dakota, Montana, and Minnesota grow nearly all the flaxseed produced in our country. Man has not succeeded in producing good seed and good fiber in the same plant. Flax for fiber must be harvested before the seed is ripe, which, of course, makes the seed of poor quality.

If the seed is permitted to mature, the fiber is too coarse for the weaving of good linen, and can be used only in the manufacture of binding twine, insulating material for refrigerator cars, and very heavy paper such as is used in cement bags.

A field of flax.

Sugar. — A few generations ago sugar was a luxury. To-day it is considered a necessity in all civilized countries. At present the world's crop amounts to about 16,000,000 tons, two thirds of which is produced and consumed in

Europe and North America. The people of Great Britain and the United States are the greatest consumers of sugar. The former use each year 86 pounds per capita and the latter 82 pounds. In spite of the fact that we produce a large amount, our greatest import is sugar.

Sugar Cane. — Sugar cane grows in the Southern States. More than two thirds of this crop is grown in Louisiana, in the delta of the Mississippi. Some of the Louisiana sugar plantations contain several thousand acres each. The cane, which resembles corn, grows as high as fifteen feet, in rows six or seven feet apart. It grows from buds at the joints of the stalks, which are laid end to end in furrows, three rows being placed side by side. This must be done by hand; then soil is thrown over the cane by a plow. One planting lasts two or three years. In October

Sugar cane in Louisiana.

the laborers cut the cane stalks by hand, as near the ground as possible.

The leaves contain very little sugar, so they are stripped off. The stalks are carried on cars to the factories. There huge rollers crush them and squeeze out the juice. In the sugar mill this juice is boiled and crystallized into raw sugar. Then it is shipped to the refineries, usually found in distant states. The crude sugar is boiled and filtered, and finally placed in barrels as pure sugar. The machinery required for these final processes is so expensive that there are very few refineries in the United States, although our country ranks first in this business. We import raw sugar from the East and West Indies, Hawaii, South America, and Europe; and turn it into snow-white granulated, loaf, or powdered sugar.

Beet Sugar. — About half of the world's sugar is made from the sugar beet. In its fleshy root is stored the sweet substance, which man extracts by mangling and boiling. The juice is manufactured into sugar in much the same way as that of the sugar cane. The beet sugar industry has thrived in Europe since 1850, when a German chemist discovered a method of extracting the sugar. For many years it has been an important occupation in Germany, Russia, Austria-Hungary, and France. During the last decade of the nineteenth century considerable attention was given it in our country, and it is now yielding large crops in Colorado, California, Michigan, Utah, Idaho, and Wisconsin.

Cane and beet sugar are competing with each other in supplying the world's demand. Cane has the advantage in ease of cultivation. While the task of planting it is irksome, it is not so tiresome as the work required by the

Irrigating a field of sugar beets.

beet. The sugar beet has the advantage of a larger area of possible cultivation than sugar cane has. It grows in temperate climates, while the cane is confined to warm belts. To promote sugar beet production some European countries pay bounties to the producers.

Tobacco. — One of the most important plants found in America is tobacco. Before our country had a money system of its own, tobacco was the "coin of the realm" in some of the colonies. We are told that the early Virginia planters even purchased a shipment of wives with this product of their fields. The leading tobacco states are Kentucky, North Carolina, Virginia, Ohio, Tennessee, Pennsylvania, Wisconsin, South Carolina, Maryland, West Virginia, and Connecticut. The United States is the great-

est exporter of tobacco, large quantities being sent to Europe, Asia, Africa, and South America.

An extract of tobacco is a destroyer of certain plant pests in nursery gardens. When sprinkled on the most delicate flowering plants, the blossoms remain uninjured while the insects are soon killed. This extract is of great value in the vineyards of Germany, France, and Italy, where it is used to destroy grape parasites. Used as a sheep dip it destroys ticks which bury themselves in the wool and damage the fleece.

Educational Work. — The national government has a Department of Agriculture whose business is to study soils, crops, and farm animals, and to do many other things that will benefit the farmers of this country. This department

Cutting tobacco, Kentucky.

employs hundreds of scientific experts, who are engaged in many lines of investigation. The Bureau of Soils is the

branch of the department that studies the soils of the United States. Other leading branches of the department are Bureau of Plant Industry, Bureau of Animal Industry, Bureau of Chemistry, Weather Bureau, and Forest Service.

Each state has a college of agriculture and an experiment station in which scientific agriculture is taught and agricultural experiments are carried on. As a result of this study, great improvements have been made in farm methods and in the general welfare of the farming population. Worn-out sections in the East and West have been almost made over. Wide-awake, public-spirited men have set up model farms where scientific methods are put into practice, and they share their knowledge with the farmers of the neighborhood. Thus the whole community is benefited by the practical agricultural teaching of scientific men.

Questions and Exercises

1. Make a collection of grains and other farm products. Collect good pictures of agricultural activities, such as wheat harvesting, haying, cotton picking, and corn harvesting.

2. Visit a wheat field, a cotton field, a sugar plantation, a hay field, or an agricultural college.

3. Find the present market prices of the products mentioned in this chapter. Are the prices rising or falling? Why?

4. On the map of the world point out every continent, country, and city spoken of in this chapter.

5. Is wheat or corn more valuable to us? Give reasons for your answer.

6. Which of the leading field crops do not grow in your section? Why?

CHAPTER XIV

VEGETABLES AND FRUITS

The pioneers, after coming to America, introduced many European fruits and also began to cultivate some of the native wild fruits. For a long time only enough for immediate local consumption was produced. But when express trains and fast steamers came into use, the large cities were supplied with fruits and vegetables that grew hundreds of miles away. Refrigerator cars have made long shipments of perishable goods profitable, hence large sums are realized from orchards and gardens.

Vegetables. — In many parts of the country people devote themselves to the growing of vegetables instead of field crops. This is especially the case in the vicinity of the large cities and in the warm South. Celery, lettuce, radishes, beets, beans, peas, cabbage, cucumbers, and potatoes are raised. The most important vegetable grown in the United States is the potato. The New England, Middle Atlantic, and North Central States raise three fourths of this crop. The leading states in the yield of potatoes are New York, Michigan, Wisconsin, Maine, and Pennsylvania. Most of the sweet potatoes are grown in the South.

Abundance and Variety of Fruits. — The United States has a greater abundance and variety of fruits than any other country. Because of good soil and wide range of climate nearly all kinds can be produced, — tropical fruits, such as oranges, lemons, dates, figs, and pineapples, as well as the deciduous fruits of the temperate zone, such as apples and pears. The leading fruits, in order of value, are apples,

peaches, strawberries, oranges, grapes, plums, pears, cherries, raspberries, blackberries, lemons, apricots, and cranberries. Among those of less importance are pineapples, figs, dates, gooseberries, and currants. The only fruit that is extensively imported into the United States is the banana.

There has been a remarkable increase in the quantity of fruits grown, consumed, and exported in the United States within the last decade. Our climate is sufficiently varied to enable us to have fresh fruit on our tables the year round. While the North is still covered with ice and snow in late winter, the markets offer ripe strawberries from the South. Week by week the ripening crop moves northward, so that the season lasts until July. Pineapples may be bought from the middle of April to the middle of July. Cherries last from May to August. Due to their excellent keeping qualities, apples and oranges are in the market all the year round.

Diseases and Insect Pests. — Millions of dollars' worth of fruit are lost every year through diseases and insects. Fungous diseases cause the blight of pear trees, the bitter-rot of apples, and the mildew of grapes. Common insect pests are the San José scale of many fruits and the codling moth of the apple tree. Birds destroy many of the injurious insects, but they cannot keep them under control; so the spraying of fruit trees to kill insects and disease-producing fungi is necessary in order to secure large crops of good fruit.

Apples. — The most important fruit crop of the United States is apples. In general, they are more easily cultivated and shipped than other fruits. The trees are hardy and require little care. The fruit keeps easily and so can be transported at comparatively little cost. The greatest apple-producing states are New York, Michigan, Penn-

sylvania, Missouri, Iowa, Colorado, Virginia, Kentucky, Ohio, Washington, and California.

Peaches. — In quantity and value peaches rank second among the fruits of this country. The main peach-growing sections are southern Michigan, the Lake Plains south of Lakes Erie and Ontario, the Atlantic Plain from Connecticut to Chesapeake Bay, the Southern States particularly

Picking apples.

Georgia, and the Pacific States. The peaches are picked before they are quite ripe, then carefully packed, and shipped in refrigerator cars to the large cities.

Plums. — Plums enter the market in the natural state for immediate use, and in canned and dried forms. Prunes are dried plums. The Pacific States are the great prune-producing section of our country. After the ripe plums are shaken from the trees, they are washed, assorted, treated with lye to soften the skins, and placed in shallow trays to dry in the sun. Then they are put in storage bins in which they undergo a "sweating" process. Finally the prunes are packed in boxes for shipment. Look at the can of plums on the shelf of a grocery store. Does the label show where they are grown and canned?

Grapes. — In yield of grapes California ranks far ahead of any other state. Other grape-growing districts are

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A vineyard near Lake Erie.

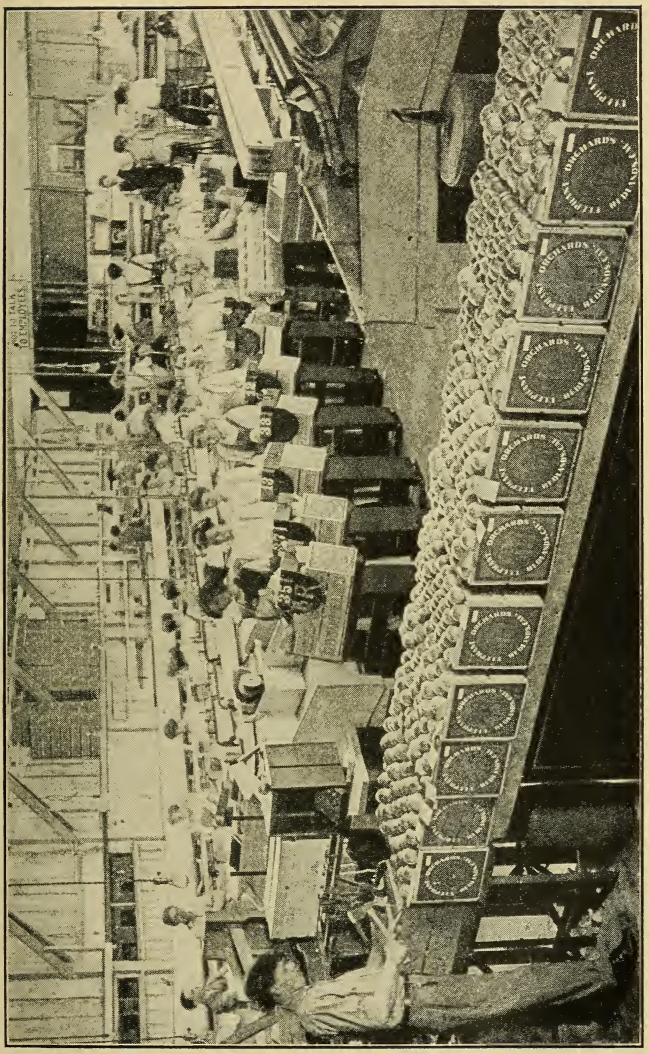
Michigan and the Lake Plains in Ohio, Pennsylvania, and New York. The most famous grape-growing section in the East is Chautauqua county, New York, on Lake Erie. Most of California's enormous yield of one million tons is made into raisins, wine, and grape juice. About one fifth is sent away as fresh grapes. The packing is done in crushed cork and redwood sawdust to prevent damage to the fruit. To turn grapes into raisins, the fruit is placed in shallow trays in the open air and the sunlight for from ten to twenty days. In order to prevent the loss that would be caused by occasional rains, some raisin firms have built drying houses in which the grapes are cured. When the drying is completed, the raisins are packed and shipped to other parts of the country. To make wine, the juice is pressed out of the grapes, fermented, and then strained. The manufacture of grape juice is done on a large scale in California and New York.

Small Fruits. — The strawberry is the most important of all the small fruits. It grows in all parts of the United States. Raspberries and blackberries grow wild, but are also cultivated; and several million dollars' worth are grown each year. These berries are produced mainly for immediate use. They must reach our tables soon after they are picked. Cranberries, so necessary to a Thanksgiving dinner, grow in moist peat bogs. The loose black soil is often covered with a layer of sand to prevent the growth of weeds. The berries grow on creeping or trailing shrubs, which are covered with water all winter and into the spring. The water protects the plants from the severe cold of winter, and delays blossoming until most of the danger from frosts is past. Nearly all of our cranberries are grown in Massachusetts, New Jersey, and Wisconsin.

Citrous Fruits. — Oranges, lemons, limes, and grapefruit are called citrous fruits. Most of the oranges of the United States are grown in California, Florida, Arizona, and Louisiana. The greatest orange district is southern California. The orange trees have glossy, evergreen leaves. Fragrant blossoms and green and yellow fruit may be seen on the trees at the same time. Most of the oranges ripen from December to July. After picking, the fruit is washed, assorted, packed, and shipped to all parts of the country and to foreign lands. Much care is taken to prevent injury to the oranges in picking and shipping. Fancy fruit is often protected by thin wrapping paper.

The lemon grows in the same sections as the orange. Lemon trees bear constantly and the fruit may be found on the same tree in all stages from the blossom to the ripe

Gathering lemons.


REDLANDS
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lemon. When the lemons reach the desired size, they are picked, whether ripe or green. The ripe ones are shipped at once, while the green ones are kept in storage to ripen. The care of lemon and orange orchards is much the same. The trees must be irrigated during the dry season. The soil of the orchards is cultivated during the spring and summer. Frosts sometimes damage the citrous orchards, hence frost protection is one problem of the fruit growers. Some orchards are equipped with hundreds of iron coal-baskets or small oil burners, which are lighted when the temperature drops to near the freezing point.

Olives. — Olives are a semitropical fruit. It has been only a short time since the United States realized that in California and Arizona the soil and climate are as well adapted to such fruits as in Italy and Spain. The largest olive orchard in the world, near Los Angeles, contains 1200 acres, each with 100 trees. The chief products are pickled olives and olive oil. The oil is made by crushing ripe olives between rollers. Olives for pickling are picked while green, soaked in lye for several days to remove the bitter flavor, then treated with water to remove all traces of the lye. After that they are placed in casks of brine and finally bottled.

Packing figs.

Figs and Pineapples. — These tropical or semitropical

fruits are grown somewhat extensively in the warmest sections of the United States. California and the Gulf coast are the chief fig-growing regions. The raising of pineapples is confined to Florida.

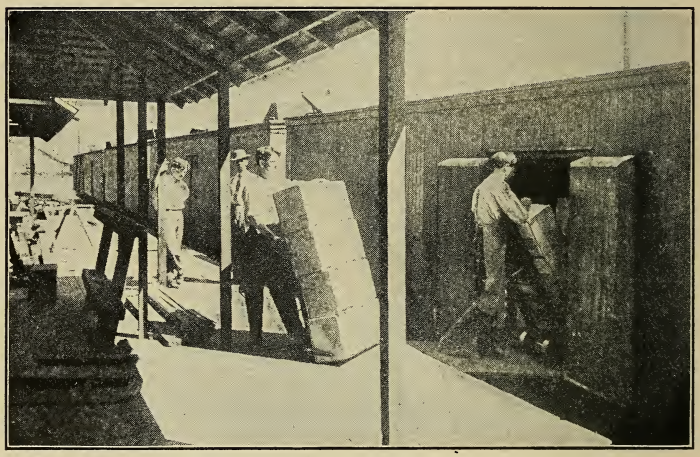
An irrigated orange orchard.

The Leading Fruit State. — California is by far the leading fruit state. It is first in the yield of oranges, lemons, plums and prunes, cherries, grapes, and olives. Large quantities of peaches, apricots, apples, figs, and many other fruits are grown. Until recently the land now occupied by the great fruit ranches of the state was desert.

Fruit Growing in Arid Regions. — Not only in California, but in other Western States, large orchards are now growing on lands that formerly were deserts. Large sections of the desert regions have soil that is very fertile, and all that it needs to become highly productive is the magic touch of water. The adjoining mountains are covered each winter with deep snows which, in summer, melt and produce great floods in the desert streams. In a short time after the snow disappears the water is all gone, and the stream beds are dry. In many places engineers have built great dams of masonry which hold back the flood water in huge reservoirs. From them, canals are built to conduct

the water to fertile fields below. Orchard lands which formerly were worthless now sell for $2000 per acre. The orange groves of California and the apple orchards of Washington and Oregon give handsome returns. In the Yakima valley of Washington apple orchards frequently yield $1700 worth of fruit per acre in one year.

Shipment of Fruit. — The railroad plays an important part in the fruit business. By the use of refrigerator cars,



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Packing oranges in a refrigerator car.

fruits can be shipped long distances, and thus very extensive markets are within the reach of fruit growers. In the refrigerator cars, which are kept cool by ice, some of the fruit in the center of boxes and baskets does not become sufficiently cool to retard ripening and check decay. To remove this difficulty, precooling of fruit was adopted a few years ago. This process originated in the peach district of Georgia, and it has been quite generally adopted

in the citrous belt of California. The fruit is chilled to 35°, 40°, or 50° either in a warehouse before it is loaded or in cars after loading. After the fruit has been thoroughly precooled, the iced refrigerator cars can keep it cool during shipment. When fruit arrives at its destination, it is kept in cold storage until it enters the market.

Conclusion. — For many years Americans gave little attention to the raising of fruit. Farmers generally had orchards merely to supply the home needs. Having set out the trees, they felt they had done their duty, and left the outcome to nature. Now orcharding in many localities has become an independent business. Many men devote all their time, energy, and capital to it. Fruit growers have formed horticultural societies in order to promote the work of improving fruits and to make each vine, bush, and tree bear more abundantly. New varieties of apples, peaches, pears, oranges, and other fruits are being created, and many foreign fruits are being successfully introduced into our country.

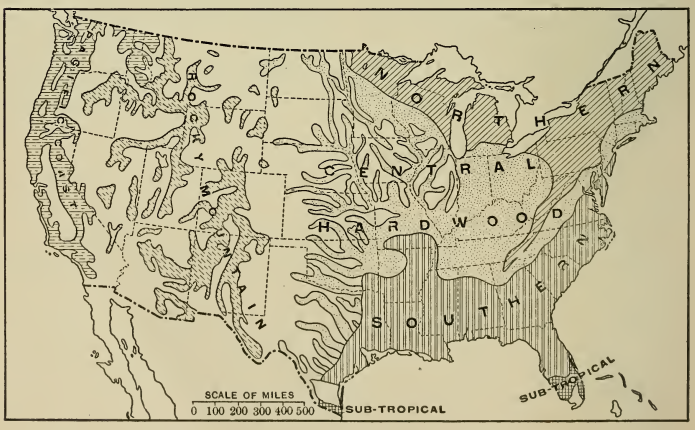
Questions and Exercises

1. Make as large a list of fruits as you can. Which of them are raised in your vicinity?
2. Examine a refrigerator car. How does it differ from others?
3. Describe a canning factory which you have visited.
4. Did you ever raise fruit of any kind? If so, tell the class about your experience.
5. Observe with special care all fruit packing cases, such as boxes, barrels, cartons, crates, crushed cork, and excelsior.
6. Define deciduous fruits; citrous fruits.

CHAPTER XV

THE FORESTS OF THE UNITED STATES

Former Extent of Our Forests. — Originally our country had forests unequaled by those of any other country. From the Atlantic Coast to the Mississippi River the country was practically one vast forest area; and in the Rocky Mountains and the mountain ranges near the Pacific there were large forests. In all there were about 850,000,000 acres of forest land. So rapidly have the forests been cleared in order to make farms or have been cut down for lumber that to-day we have only about 60 per cent of the former area, and much of the present timber land has been cut over and the best trees removed. Although greatly



Forest regions of the United States.

depleted, our forests constitute an enormous source of wealth, and we still lead all other countries in the production of lumber.

River transportation of logs.

Forest Regions of the United States. — The forest areas of the United States are grouped into five large forest regions, — Northern, Southern, Central Hardwood, Rocky Mountain, and Pacific Coast forests.

Northern Forest. — The main body of the Northern Forest lies in Maine, New Hampshire, Vermont, New York, Michigan, Wisconsin, and Minnesota. A southward extension follows the Appalachian Mountains to their southern border. The most important trees of the Northern Forest are pine, spruce, hemlock, white cedar, and fir. By far the most valuable species of this forest is the white pine which has been so extensively used for lumber. The greater part

of the Northern Forest has been cleared, but in northern Maine, the White Mountains of New Hampshire, the Green Mountains of Vermont, the Adirondacks of New York, the northern parts of the Lake States, and the Appalachians there are still large forest tracts.

Central Hardwood Forest. — The greater part of the Central Hardwood Forest occupies the drainage basin of the Ohio River. Part of it lies west of the Mississippi, in the states of Missouri, Arkansas, Oklahoma, and Texas. The chief trees of this hardwood forest are oak, hickory, poplar, beech, walnut, ash, and elm. North of the Ohio nearly all of this forest has been cut down to make way for farms. In West Virginia, Kentucky, Tennessee, and Arkansas there are still great forests that supply very large quantities of lumber. Much of the hardwood lumber is used in the manufacture of furniture, flooring and interior finish of houses, and agricultural implements.

Southern Forest. — The Southern Forest lies mainly in the Atlantic Coast Plain and Gulf Coast Plain of the Southern States. This forest consists mainly of pines that have a hard, yellow, resinous wood. These yellow pines, as they are called, are valuable not only for lumber, but they also yield turpentine and tar. The cypress, growing in swamps, is another tree of great value. Its wood is so durable in contact with moisture that it is in great demand for shingles, boats, and tanks. The Southern Forest furnishes enormous quantities of lumber and other timber products. Louisiana is the leading lumber state of the Southern Forest and ranks second among the states of the Union.

Rocky Mountain Forest. — The Rocky Mountain Forest occupies the slopes of the Rocky Mountains. The most dense tracts of timber are upon the western slopes, which

Making a trail through a western forest.

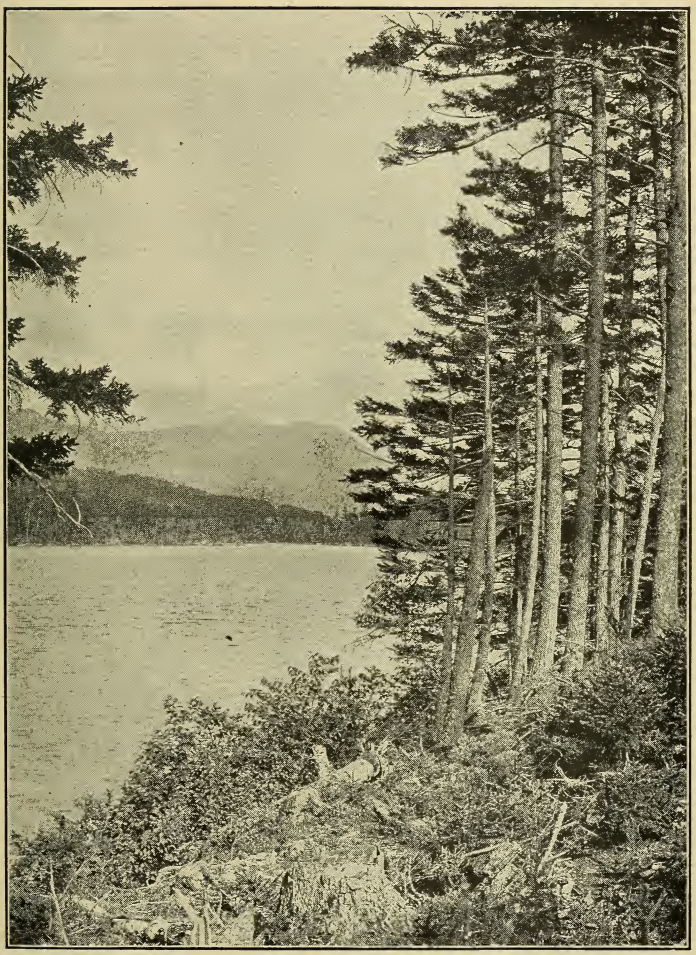
have sufficient rainfall for tree growth. Western pines and other cone-bearing trees constitute most of the trees of this forest.

Pacific Coast Forest. — Upon the western slopes of the Coast Ranges, Cascade Mountains, and Sierra Nevada are the great forest areas of the Pacific Coast Forest. The most important tree of this forest is the Douglas fir. Other valuable trees are cedar, spruce, hemlock, western white pine, and redwood. The densest forests are in Washington, upon the well-watered slopes facing the Pacific. This state leads all others in the production of lumber. The most wonderful trees in the world are the redwoods and "big trees" of California, many of which are over 300 feet

high and between 2000 and 3000 years old. Several forest tracts containing these mammoth trees have been made into national parks.

Forest Products. — Most of the forest trees are cut down and sawed into logs which are hauled to mills, where they are sawed into boards or other forms of lumber. Many other trees are cut down to furnish mine timbers, railroad ties, telegraph poles, and firewood. Spruce and hemlock are largely used to make wood pulp from which paper is manufactured. Other forest products are charcoal, turpentine, tar, tanning extracts, and wood alcohol. Game and fish in the forests of our country furnish several million dollars' worth of food, and millions of dollars are realized also from the raw furs of forest animals. In the West millions of cattle and sheep graze upon the national forests.

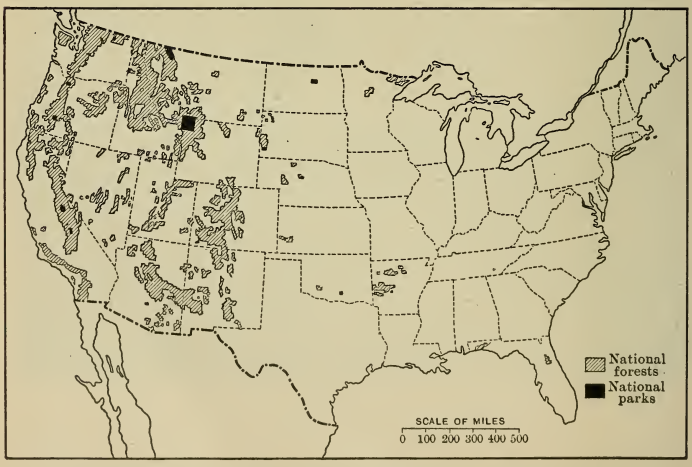
Forest Influences. — Forests exert considerable influence over the flow of streams whose drainage basins are wholly or partly within the forested area. A large amount of the rain is held in the thick leaf mold on the forest floor. This gradually soaks into the ground and appears again in springs several weeks later. Thus forests prevent extreme floods in time of heavy rain and very low water in times of drought. In order to keep some of the rivers navigable even in dry seasons the Federal government is buying wooded tracts near the headwaters of the streams so that the forests may be kept permanently to regulate stream flow. In the irrigation regions of the West forests are maintained at the headwaters of the streams that furnish water for irrigation in order to keep up the flow of water throughout the whole year. In the prairie regions of the United States the farmers plant groves of trees on the windward side of their houses to protect them against destructive storms of summer



Wooded slopes bordering Seaghton Lake, Maine.

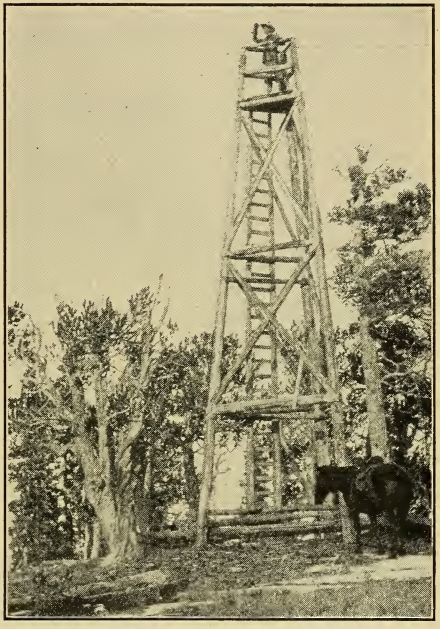
and cold winds of winter. The soil on steep wooded slopes is held in place by the roots of the trees. When the trees are cut down, the soil is washed away, and the slopes are left too barren to support plant life. Such slopes should be kept permanently in forest.

National Forests. — The United States had such an abundance of standing timber that for many years no one dreamed that it could be exhausted. By and by, however, people saw the end of the supply would soon come if forest destruction was not checked. To insure a permanent supply of timber, Congress in 1891 passed a law that forests on the public lands could be reserved from settlement and made into national forests. To-day the United States has about 140,000,000 acres in national forests, an area equal to that of Indiana, Illinois, Iowa, and Missouri. Nearly all of these national forests are in the Western States; some of the smaller ones, however, are in the eastern part of the country.



National forests and national parks of the United States.

The Forest Service. — The Forest Service, a branch of the Department of Agriculture, has charge of the national forests. The trained foresters of the Service supervise lumbering operations in these forests, remove dead and diseased trees, plant new trees, guard the forests against fires, and regulate the grazing of live stock within the forest. The Forest Service, in addition to its care of the national forests, conducts a campaign of education in forestry. It gives instruction in such subjects as prevention of waste in lumbering and manufacture of wood products, increasing the productivity of forests, uses of commercial woods, methods of fighting destructive insects and diseases, fire prevention, and the preservation of wood by chemical treatment.



Ranger looking for fires.

Conclusion. — Although large areas of forests have been cut down in order to furnish lumber and to make way for farms, yet we still have enormous areas of woodlands. Lumbering and the manufacture of wood products is one of our leading industries. The American people are extensive

users of lumber and other timber products, but the present forests will be ample to meet future needs if they are brought up to their maximum yield and if all avoidable wastes are prevented and the fullest possible utilization made of all timber.

Questions and Exercises

1. Name and locate the five forest regions of the United States.
2. Which are the two leading lumber states?
3. What are national forests?
4. What influences do forests exert over floods?
5. Make a list of the chief forest products.
6. Visit some factory where wood products are manufactured.
7. Make a collection of different kinds of wood. Learn the chief uses of each.

CHAPTER XVI

DOMESTIC ANIMALS OF THE UNITED STATES

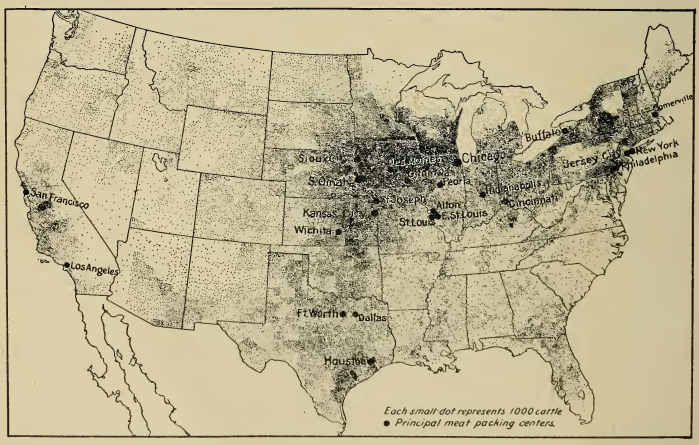
Importance of Domestic Animals. — While plants are very useful in supplying man with the necessities of life, animals are scarcely less important. They furnish meat for food, and skins for clothing and shelter. By affording means of transportation they greatly promoted civilization in the early stages of man's development. The North American Indian was acquainted only with the wild life of the forest, and knew nothing of the care and value of domesticated fowls, sheep, cattle, and horses. As long as the game in the forest, together with wild roots, herbs, and berries, were plentiful, the Red Man knew no want, for hunting was his greatest joy. But when the long cold winters made game scarce, famine stared him in the face.

Longfellow gives us a vivid picture of the suffering at such times:

O the long and dreary winter!
O the cold and cruel winter!
Ever thicker, thicker, thicker
Froze the ice on lake and river;
Ever deeper, deeper, deeper,
Fell the snow o'er all the landscape,
Fell the covering snow, and drifted
Through the forest, round the village.
Hardly from his buried wigwam
Could the hunter force a passage;
With his mittens and his snowshoes
Vainly walked he through the forest,
Sought for bird or beast and found none,
Saw no track of deer or rabbit,
In the snow beheld no footprints;
In the ghastly, gleaming forest
Fell, and could not rise from weakness,
Perished there from cold and hunger.

When the white men arrived, they used the bison, deer, and other wild animals for food, but with their advanced notions of living they could not go back to that primitive condition of depending on game alone; and so from the start they introduced European animals, — chickens, geese, cows, horses, swine, and sheep into this New World.

Present Rank of the United States in Meat Production. — The three greatest meat-producing regions in the world are Australia, Argentina, and the United States. Because of her excellent sheep pastures, Australia exports large quantities of mutton. The boundless pampas of Argentina, where the population is still scarce, afford excellent feeding grounds for both sheep and cattle; therefore that country supplies the world with much beef as well as mutton. Because of its enormous corn crop, our own country ranks first of all in the production of meat animals, especially in hogs and beef cattle. Densely populated Europe,



Distribution of cattle and principal meat-packing centers of the United States.

where there are limited pastures and but little corn, depends largely upon these three countries for its meat.

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A cattle ranch, Texas.

Cattle Industry. — In 1910 in the United States there were more than 60,000,000 cattle. Texas, Iowa, Kansas, Nebraska, Wisconsin, Missouri, Illinois, New York, Minnesota, and California are the ten leading cattle states. This shows that the industry is very widely distributed, but that the South is not well represented. The largest cattle markets are Chicago, St. Louis, Omaha, Kansas City, Sioux City, and Cheyenne.

Cattle Ranches on the Plains. — In the western mountains and plains where the population is not dense, and where the rainfall is too scant for profitable agriculture, but sufficient to produce good pasturage, there are large cattle ranches, sometimes thousands of acres in extent.

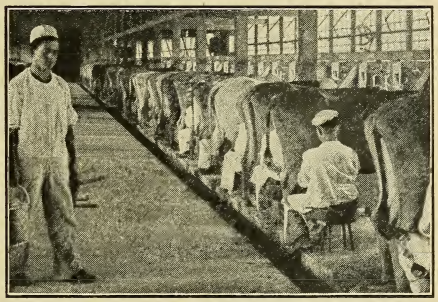
The most noted ranch states are Texas, Montana, Wyoming, and Colorado. Formerly when much of "the plains" was still public land, the animals were turned loose to wander at will over wide ranges of territory. This is still true in a few places. They practically take care of themselves, summer and winter. These roaming cattle require about twenty-five acres each for a year's support. Now that public land is becoming scarce in many places and farms are becoming more numerous, men have to fence in their stock, and raise alfalfa or other feed for the winter store.

Cattle in the Corn Belt. — The cattle in the corn belt, including Illinois, Iowa, Missouri, Nebraska, Indiana, Kansas, Ohio, Minnesota, Wisconsin, and Michigan, fare even better than those on ranches, for corn is a very nutritious cattle food. So this is the greatest cattle-raising section. Much of the corn is fed to the cattle as silage. The corn is cut while green, and the stalks, leaves, and ears are stored in large air-tight wooden or concrete structures called silos. Kept from contact with the air silage remains green and nutritious, and is fed as needed during the winter.

Dairy Products. — About one third of our cattle are raised chiefly for milk. The production of milk is largest near the great centers of population; and the majority of these at present are in the eastern and north central parts of the country. New York, Wisconsin, and Iowa have the largest dairy interests. Minnesota, Illinois, Texas, Pennsylvania, Ohio, Missouri, and Michigan also carry on considerable dairy business. Since 1900, this industry has been making great progress in the Pacific States, especially in the Willamette valley.

Pure Milk Supply. — Great interest is taken in the question of pure milk supply. Formerly a dairyman and

his family cared for their cows as best they could, milked them mornings and evenings, and put the milk into three- or four-gallon cans. In the early morning one of the men peddled it among town customers, pouring a pint or a quart into each buyer's bucket or pitcher. To some houses he came before the people had risen. There he placed the uncovered milk on the doorstep, where it absorbed foul air, dust, and even flies. At other houses he arrived long after breakfast. These families either had no milk for the morning meal or they used what was left from the previous day. No one complained, because people knew of no better way. At the present time, dairies are kept in much better sanitary condition than in the past. Now both animals and barn look as if they had a daily bath. In many places the cows pass through clear water to clean their feet before entering their stalls to be milked. The single stalls are well partitioned from neighboring ones, so that the creatures may not molest each other. The barn is frequently whitewashed; the stalls are cleaned daily, and the milkers do their work in clean white trousers and jackets. Then the milk is bottled, chilled, and delivered at a regular hour.

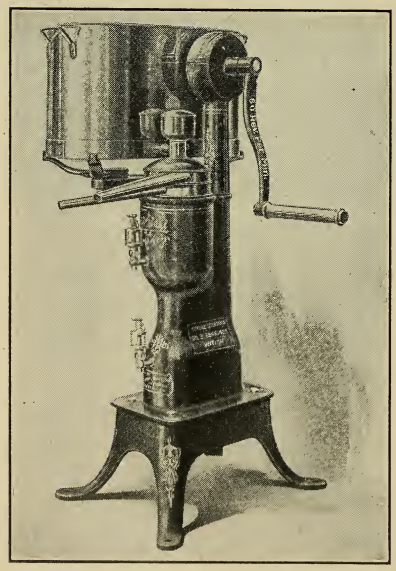


A well-kept dairy barn.

Where farmers have only a few gallons to sell, they make arrangements with the milk station to collect the milk twice daily. The collector gathers all he can from a given

territory, takes it to the railroad, on which it is carried by steam or electric cars to the milk station, which pays for it not by the gallon, but by the amount of butter fat it contains. There is often great difference in the size of the cream collars in various bottles of milk. This is due to the difference of fat in the milk given by cows. A gallon of milk from one cow may be worth twice as much as the same amount from another.

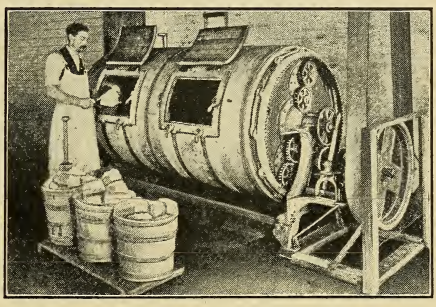
When the milk from a number of farmers arrives at the milk station, it is all poured into large vats, where it is pasteurized and standardized. In pasteurization, the bacteria injurious to health are destroyed. The standardizing process thoroughly mixes the milk from the various farms so that it is uniform in quality. Some of the employees are kept busy scalding the bottles in hot lye solutions and rinsing them with clear water so that they are perfectly clean. After the milk has been standardized, the bottles are filled, and sealed by machinery with a little circular pasteboard cap. Then they are stored in the refrigerating rooms until the delivery men load them shortly after midnight and make their lonely trips through the quiet streets while we



A milk separator.

are sleeping. The bottle of milk appears at our doorstep in time for breakfast every morning of the year.

Butter and Cheese. — Much butter is manufactured in large creameries. The milk gathered from the various farms is poured into a machine called a separator, which separates the cream fat from the thin milk. In a revolving churn driven by an engine several hundred pounds of cream are whipped and kneaded into butter, which is then salted, packed, and shipped to near-by points. Most of the cheese is also machine-made. It is produced by cooking, draining, and kneading the curds of sour milk. About one fourth of the world's supply of butter and cheese is manufactured in the United States. While our country ranks as the greatest producer of dairy products, it exports very little butter and cheese.



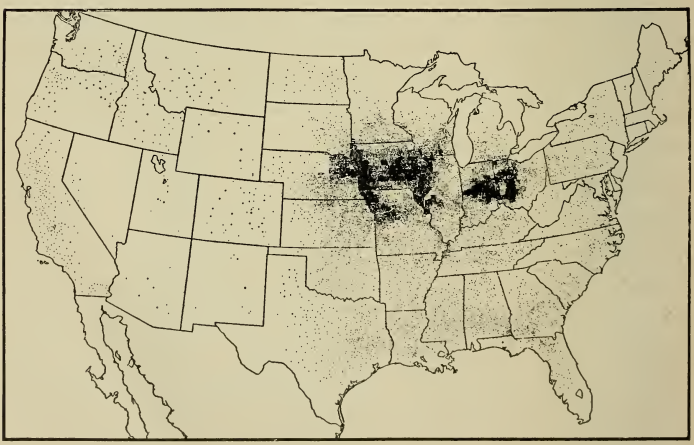
Churning butter.

Coöperative Dairying. — Prosperous dairying does not always depend upon natural advantages alone. In some ways the prairies of Kansas and Nebraska are better fitted for this business than Minnesota and Wisconsin. The latter, however, make greater progress because they have formed coöperative creameries. That means that the farmers themselves own and help manage the factories and so make all the profits; while in the states farther west the farmers sell to large private creameries that pay much less per pound for butter fat than the coöperative

establishments in the North. This lesson of coöperation was learned from little Denmark, which exports more butter than any other country in the world.

Butter Substitutes. — Oleomargarine and butterine are butter substitutes made of the softer animal fats that are pressed out of beef tallow and suet. After these are churned with sweet milk and cottonseed oil, they are kneaded and salted just as butter is. Oleomargarine so closely resembles butter that it is sometimes sold as butter. When substitutes are sold as butter, a great injury is done to the dairy industry. To protect it and the consumer, Congress has passed a law requiring honest labeling of certain food articles, and prohibiting the coloring of oleomargarine to make it resemble butter.

The Swine Industry. — The United States produces more swine than any other country; indeed, the American



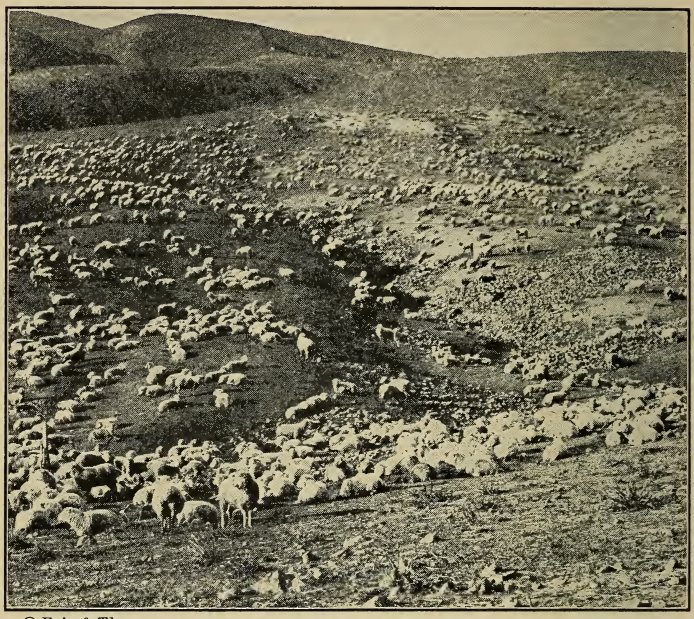
Distribution of swine in the United States. One dot represents 2,500 swine.

A herd of swine.

farmers raise more hogs than Russia, Germany, and Austria combined, the next largest producers. We are able to supply one third of the world's pork because of our large corn crop, fifty per cent of which is fed to hogs. Live animals are not exported in great numbers, but flesh goes into foreign lands in the form of cured, canned, or fresh meat, or as lard and other packing-house products.

Hogs are raised in every part of the country, but the great swine region is in the corn belt of the North Central States, in the very heart of the continent. The leading states in 1913 were Iowa, Illinois, Missouri, Nebraska, Kansas, Indiana, and Ohio. Omaha, Kansas City, Chicago, St. Louis, Milwaukee, Indianapolis, Cleveland, Buffalo, and Cincinnati carry on a large pork-packing business.

Sheep Raising and the Wool Industry. — Sheep yield fiber for clothing and mutton for food; but man has not yet learned how to produce a sheep that will yield both



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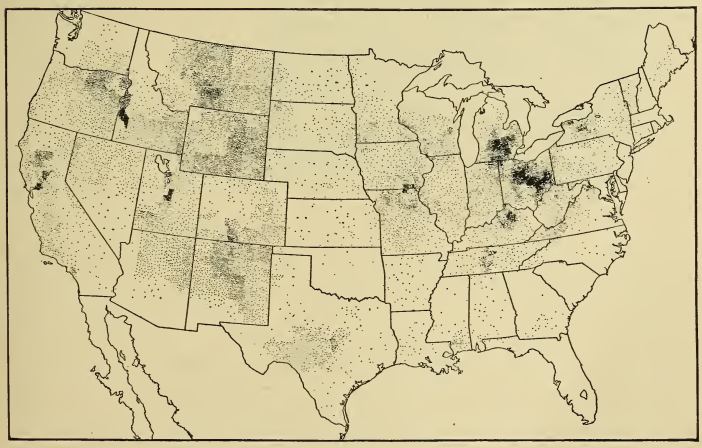
A sheep range, Idaho.

excellent meat and first-class wool. Argentina and Australia lead in mutton sheep; but the United States raises the sheep chiefly for its wool. Our earliest imported sheep were not good wool producers, so 26,000 merino sheep were brought from Spain in 1810, and scattered in various sections. This breed produces a very strong fiber, and thrives well on the coarsest food.

In general sheep can get a living on land that will not support other animals, so they are well adapted to mountainous regions. They do well even on pastures that have been cropped almost to starvation point by cattle. For these reasons sheep raising has followed close

upon the heel of the cattle ranches in the semiarid western plains, and the western mountains have taken the lead in sheep production.

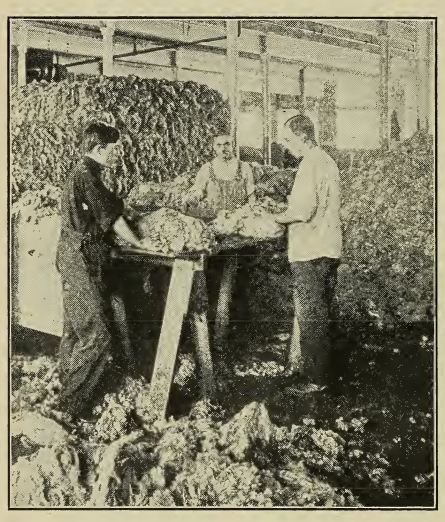
The American Wool Clip. — The wool clip of the United States meets only two thirds of the home needs. The remaining third, of a finer quality than our own and used for a better grade of goods, comes from foreign lands. Ohio and Michigan lead among the wool-producing states of the East. Montana, Wyoming, New Mexico, Idaho, Oregon, California, Utah, and Colorado rank first in the West. The greatest profit from sheep raising comes from the wool which is clipped from them. Once a year, after the warm weather of summer is assured, the sheep are sheared. Long ago this was done by hand. Now they are shorn of their warm fleeces in a few minutes by machinery. The wool is baled into



Distribution of sheep in the United States. One dot represents 2,500 sheep.

bundles of several hundred pounds each and shipped to various manufacturing centers.

Manufacturing Woolen Cloth. — Most of the wool is sent to eastern cities, especially to Boston, the largest wool market in the United States and the second in the world. From Boston the fleeces are distributed to various cities to be manufactured into cloth. Providence, Lowell, Manchester, New York, and Philadelphia have the greatest woolen factories in the country. The last-named city and the surrounding towns of Camden and Chester weave fine carpets. Today the United States manufactures more carpets than any other country.



Wool sorting.

When the fleeces reach the factory, they are sorted according to quality and length of fiber. Then they are washed with soap to remove the grease and dirt. In this process the very greasy fleeces lose from one half to four fifths of their weight. The grease, which sometimes amounts to three fifths of the entire weight, is converted into soap. The scoured wool is treated with acid to destroy all vegetable matter that may have been left after the washing. Next it is combed and spun into yarn which

is woven into cloth. Woolen fabrics have many different names; such as, worsted, flannel, serge, broadcloth, cheviot, cassimere, velvet, and plush. Often wool threads are woven with cotton and silk, thus producing mixed goods. Before the cloth comes to us in the form of a garment it is steamed, shrunk, pressed, measured, and carefully wrapped around a board, in lengths of forty or fifty yards. The bundle is then incased in paper. A number of such packages are placed in a box and shipped to the tailors.

Value of our Sheep Products. — The annual wool clip of the United States is worth nearly 100 million dollars. Manufacturing raises its value to between 300 and 400 million dollars. The mutton product is worth about 50 million. The skins are made into leather; the tallow into candles; the bones into fertilizer. These products, added to the meat and wool, make the sheep a profitable part of our animal industry.

The Goat Industry. — Goat raising is not an important industry in the United States, although widely scattered throughout the country. Over a third of the goats are Angoras, many of which are descended from nine Angoras introduced from Turkey in 1849. About that time an American was sent to Turkey, upon the Sultan's request, to do some experimenting in cotton raising. The ruler was so pleased with the results, that he gave the nine goats as a present to the man who showed him how to raise cotton.

The fleece, called mohair, of the Angora is sometimes nineteen inches long. This fiber is woven into cloth and carpets and also a high grade of plush, much used in railway car upholstery. Goats also yield rich milk, fine pelts for rugs and robes, and excellent skins for leather.

They can be easily raised on land that is practically valueless for farming. Through their browsing, goats help to clean out shrubs and seedling trees from wooded localities.

Poultry and Eggs. — Last but not least of the domestic animals that are raised for food are fowls — chickens, geese, ducks, and turkeys. The rapidly increasing population has created a large demand for poultry and eggs.

A poultry farm.

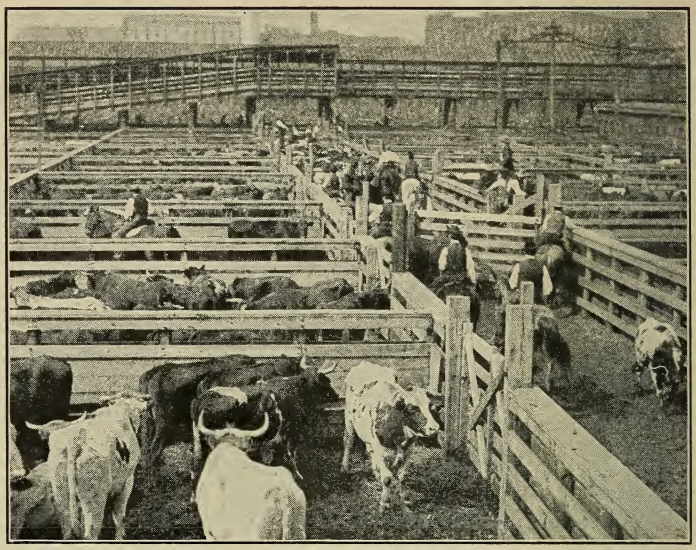
While almost every farmer raises poultry, yet many people devote themselves entirely to this industry. Since corn is well adapted to egg production as well as for fattening fowls, the corn belt exceeds all other regions in the number of poultry. The leading states are Iowa, Illinois, Missouri, Ohio, Kansas, and Indiana.

Ostrich Farming. — Ostrich farming is a young industry in the United States. The first birds were imported in 1882; and it took a long time for men to learn how they

can best be raised in this climate. In 1910 they numbered a little over 6000. They are produced in Arizona, California, Arkansas, Florida, and Texas. Dry sandy soil with good drainage and irrigation facilities, well adapted to the raising of alfalfa, is best suited to successful ostrich production. As the demand for ostrich feathers increases, the future prospects for this industry seem good. The average annual yield of feathers per bird is a pound and a quarter, worth about twenty-five dollars. A pair of breeding ostriches is worth about eight hundred dollars; a chick six months old brings a hundred dollars.

Horses. — The remaining domestic animals raised for profit in the United States are horses and mules. They are valuable for draft and farm use. While raised in all the states, horses are most numerous in the North and West. The finest light saddle horses are produced in the Kentucky blue-grass districts; therefore Lexington is the chief race-horse market in the country. For some time our work horses did not compare favorably with those of Europe. But recently they have been improved by the importation of high-grade European stock. It has not been long since the countries of Europe have been willing to buy our horses. Omaha and Kansas City, in the midst of the corn and grazing districts, are the leading centers for work horses.

Mules. — Since horses cannot stand so warm a climate as mules, the latter are in greater demand in the South. At the last census there were twelve times as many horses as mules in the North, while in the South there were only one and a half times as many. The value of mules consists in their enduring quality and their ability to stand hard usage, such as railroad construction work. The mule is



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Stockyards, Chicago.

also receiving increased favor for farm use. One reason for his popularity is that the expense of keeping him is less than for the horse.

Stockyards and Packing Houses. — Cattle, hogs, and sheep raised for meat are shipped in stock cars to the cities where the great packing houses are located. On their arrival the trains stop alongside stockyards, which may cover many acres and look like cities laid out in pens, separated by board fences. Each pen has a gate leading into the long passageways that form the streets of the yards. As soon as the door of the car is opened, the animals walk down inclined gangways into the narrow roads. Men and boys with long wooden staffs guide them to their various pens, where the animals are fed, and inspected by

prospective purchasers. Those remaining are soon taken to the packing houses, where they are quickly killed. Within a few minutes after the operation they hang as dressed beef, pork, or mutton in the refrigerators of the abattoirs. After the meat has been sufficiently chilled, it is placed on the market.

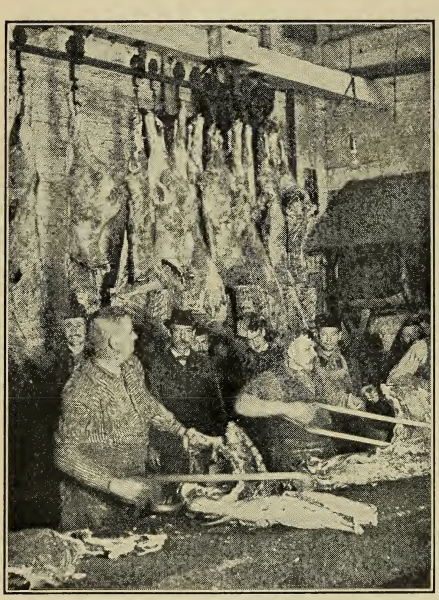
To promote the health of employees and consumers, much attention is given to the sanitary conditions of packing establishments. They must be well lighted, have an abundant supply of pure water, a perfect system of immediate sewage removal and the very best system of ventilation. The ceilings, walls, columns, and floors should always be perfectly clean. Well-lighted and thoroughly ventilated dressing rooms for employees are a necessity.

Exports of Animal Products. — While our foreign shipments of animal products have been very large in the past and are still an important part of our exports, there has been an annual decrease for several years. This is due to a number of causes. Our growing population has decreased the surplus supply. Argentina, Australia, New Zealand, and South Africa have come in as competitors. Great Britain is reducing her purchases from us because she is so well supplied by her colonies. However, she still buys about half our meat exports.

Refrigeration of Meat. — The exportation of meat, fish, oysters, fruit, dairy products, and other perishable food would be out of the question if we had no means of preserving them while on the journey. The world's trade has been greatly increased since 1875 by cold storage devices used in cars and steamers. The first meat carried in a refrigerator car was sent from Chicago to Jersey City, when our country was a hundred years old. Before the

days of cold storage live animals for meat were exported on cattle ships.

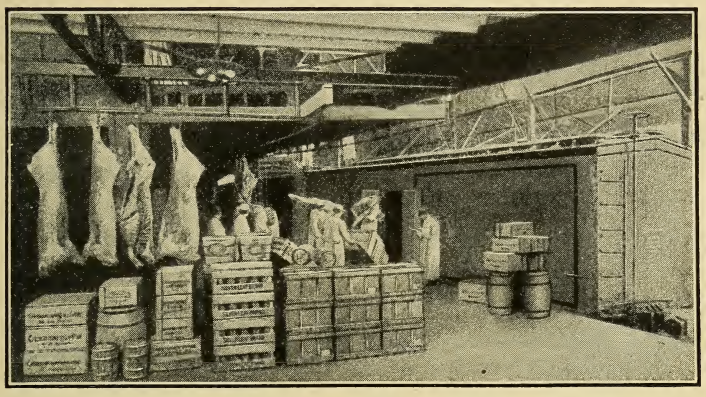
Preserved Meats and Extract Products. — There are other means whereby meat products may be transported long distances and stored many months. Beef, pork, fish, and mutton may be salted, dried, canned, or smoked. The fat of cattle and hogs is rendered into lards and cooking oils. Part of the meat is ground up, seasoned, and pressed into sausages, which can be smoked and preserved for months. We even extract the juice from the meat and seal it in small jars, or compress it into broth tablets.



© Underwood & Underwood.
Meat packing.

Animal By-products. — The discovery of uses for every part of cattle, hogs, sheep, goats, and poultry has added millions to our wealth and many conveniences to our daily living. Our great cattle and sheep industries have given the United States the lead in the manufacture of leather footwear. Millions of boots and shoes are made in Brockton, Lynn, and other Massachusetts towns, and also in New York, Rochester, Philadelphia, Cincinnati,

Chicago, and St. Louis. Rawhide is made into ropes, machinery belts, and whips. A writing parchment and a bookbinding material are made of the skins of calves, goats, and sheep. Dressed sheepskins also make fine rugs. Pigskins are made into saddles and satchels. Horse flesh is eaten in several European countries, France and Germany,



Loading a refrigerator car with meats.

for example. Horsehide is manufactured into shoe leather, saddles, and razor strops. Gloves are made of the skins of lambs, goats, and other animals.

From the tallow are produced oleomargarine, lubricants, leather dressing, soap, and candles. The feet, hide cuttings, and sinews are turned into gelatin and sizing. Combs, buttons, chemicals, handles for knives, toothbrushes, and umbrellas are manufactured from the bones, horns, and hoofs. Bones are also converted into glue, charcoal filter, and boneblack. The long tail hairs of cows and horses are used for haircloth and bowstrings for musical instruments. Pepsin is prepared from the lining of the stomachs,

sausage casings are made of the intestines, and fertilizer is obtained from the refuse parts of all domestic animals. The short body hair is made into roofing felt and is mixed with lime to form plaster. Feathers are made into pillows, and wool makes the most serviceable winter clothing. Is there any doubt that animals play a valuable part in the civilization and advancement of man?

Improving American Animals. — Man has made great improvements in domestic animals. The colonists brought their stock with them from England, Holland, and other European countries. The greater number of American cattle have descended from these. Not until the nineteenth century was any interest taken in purity of breed, but since then animal breeding has received considerable attention. Men especially interested in this field have formed cattle, swine, sheep, and poultry associations which hold annual conventions for the discussion of vital questions. There are more than 100,000 stock raisers who produce only pure-bred animals. In recent years good breeds have been imported from Europe, where stock raising is studied with great care. By intelligent experimenting, men have learned how to breed sheep for mutton or wool, horses for speed or hard work, and cows for milk or beef. Greater profits have resulted from feeding to stock the food best adapted to produce desired qualities of flesh, wool, or milk.

Bureau of Animal Industry. — The most progressive nations are making careful studies of the diseases of domestic animals, in the hope of eventually stamping them out. The United States Department of Agriculture has a Bureau of Animal Industry which is giving much attention to all matters pertaining to animal welfare. They publish the

results of their investigations and experiments in bulletins, which are distributed among farmers and stockmen. An important work of the Bureau is the inspection of meat in packing houses. All meat for export and for interstate trade must be examined by the Federal inspectors. Thus consumers are protected from diseased meat.

Questions and Exercises

1. Explain how the development of the cattle industry depended upon inventions.

2. What animal serves man most in supplying material for clothing?

3. Make as complete a wool exhibit as possible.

4. Color an outline map of the United States, showing the chief districts in which cattle are raised. In which sheep are raised. In which horses are raised.

5. Make a list of the names of canned and preserved meats that you find on the market or in advertisements.

6. Prepare an exhibit of pictures of domestic animals, their food, shelter, and by-products.

7. Tell how you would ship a load of hogs from an Iowa farm to Chicago. A cargo of meat from Chicago to Liverpool. To Hamburg.

CHAPTER XVII

FISHERIES OF THE UNITED STATES

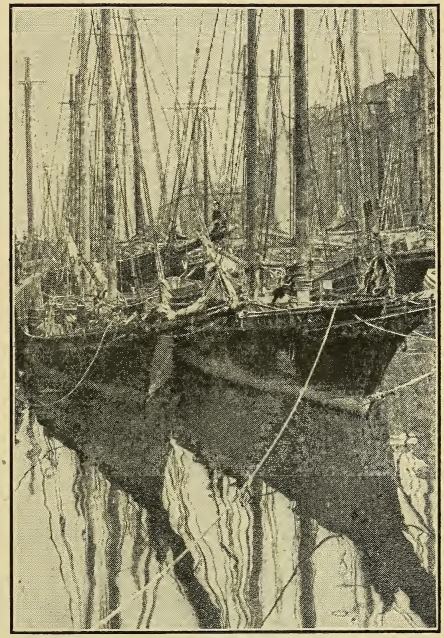
A discussion of the animal wealth of our country would be incomplete if we overlooked fish. This country first entered its commercial career by the export of fish in addition to lumber and tobacco. To-day the United States has fishery resources valued at $55,000,000 a year, which give employment to 150,000 fishermen, and 10,000 wage-earners in canning and preserving establishments.

Fishing Grounds of the United States. — The fishing grounds adjoining the United States are well distributed along the Atlantic, Gulf, and Pacific coasts. The Great Lakes and the Mississippi and many other rivers afford excellent inland fishing facilities. To these must be added the large resources of Alaskan waters.

New England Fisheries. — The largest ocean harvests of this country are landed at Boston, Massachusetts. The earliest New England settlers were happy when they found that the coasts were teeming with the finest of cod, halibut, shad, mackerel, and herring. These fish are a great source of food and of wealth to the people, even to this day. Owing to the shallow waters of the many inlets of the North Atlantic section, which form fine feeding and spawning grounds, many fish are caught directly off the coast by the shore-line fishermen, who are usually independent workers, each the sole master of his boat.

The deep-sea fishing carried on in some cases as far as two hundred miles from shore, or as far north as New-

foundland, a thousand miles away, is done by large fast-sailing schooners having the best of outfits. There are comfortable quarters and stores of good food for the men; and water tanks and all sorts of contrivances for cleaning and salting the fish as fast as they are caught. While the boats are usually owned by rich companies whose headquarters are in Gloucester, Boston, or Provincetown, the fishermen take the keenest interest in their work, for this is a coöperative business in which the employees share in the profits of the returns. The captains of the ships know the fishing grounds and understand the weather conditions for fishing as well as the gardener understands his soil, drainage, and the climatic conditions that will lead to certain success. The fishing is usually done not from the schooner, but from small dories that are let down into the water from the deck of the larger vessel. A large crew can thus be scattered over a considerable area with several men in each boat. The dories are emptied into the schooner as soon as they are

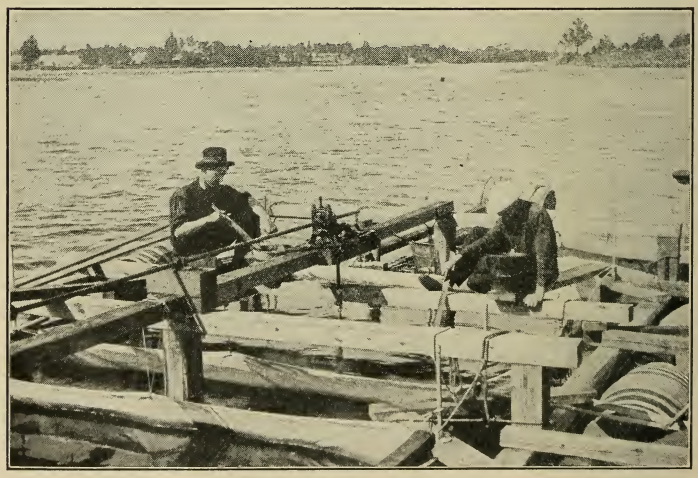


Fishing boats in Boston harbor.

filled; and when the latter is loaded, it returns to the port from which it started. There the fish are sold in the markets, or dried, or canned, and shipped to other inland cities.

Massachusetts surpasses all other New England states in its sea products, especially in cod; Connecticut ranks second, leading in oysters; and Maine, with its many indentations, islands, and rocky shores, ranks third and leads in lobsters.

Risks and Hardships of Fishing. — While this free life on the sea is alluring, there are many serious hardships connected with it, especially for the deep-sea fishermen. The "banks" off Newfoundland are often enveloped in dense fogs, which hide approaching steamers and icebergs, that without a moment's notice dash into and shatter the helpless dories, and sometimes even the large schooners.



Lobster hatchery, Buzzards Bay, Massachusetts.

Sudden violent storms drive the frail boats ruthlessly about on the wild waves and sometimes capsize them. Occasionally a boat is driven so far away from all the others that it is impossible to get back to the food supply in time to save the men from starvation. While the men are out struggling with untamed nature, their families are worrying and praying for them at home, sometimes only to learn in the end that the head of a household will never return.

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Oyster dredging.

Fisheries of the Middle Atlantic States. — The greatest commercial returns of our country from the fishing industry are netted in the Middle Atlantic group, where New York and New Jersey are the foremost producers. This is the most densely populated region in the United States, which fact, together with transportation facilities, and the adjacent inlets and estuaries well stocked with oysters, shad,

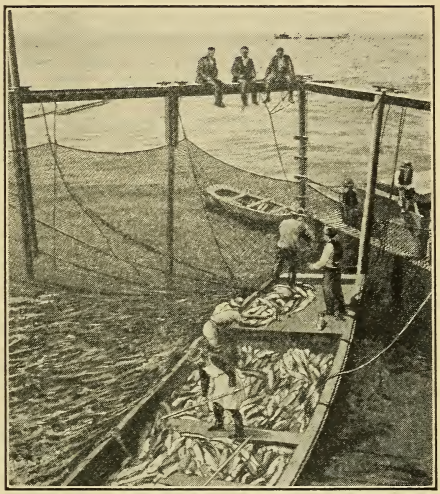
crabs, and menhaden, accounts for the extensive fishing industry. The oyster fisheries centered about Long Island Sound, Chesapeake Bay, and Delaware Bay yield a third of the entire oyster output of the United States and are the most noted oyster beds in the world. This is by far the most important sea product of the Middle Atlantic States. One of the chief industries of Baltimore is the canning and preserving of oysters. The United States sends annually thousands of barrels of oysters to Europe. So great has been the demand for this food that there is danger of exhausting the supply. Therefore, oyster farms are cultivated with as much care as grain fields. To increase the supply, countless young oysters are planted in the bays and estuaries along the Atlantic.

Fishing Industries of the South. — The chief fishing industries of the South Atlantic and Gulf States are those of oysters, shrimps, and large green Florida turtles. Florida is also renowned for its sponges, of which it markets over half a million dollars' worth annually. Sponges are the fibrous skeletons of large masses of jelly-like animals, which grow on rocks at the bottom of warm, shallow seas. They are torn from their bed by three-pronged forks. The living matter soon decays and leaves the framework. This is the sponge of commerce.

Fisheries of the Great Lakes. — Whitefish, lake trout, sturgeon, herring, blue pike, and yellow perch are the chief products of the Great Lakes, most of them being taken from the waters west of Niagara Falls. Formerly more than a million pounds of fish were obtained annually from the lakes, but the small-meshed nets, used by the fishermen, caught countless young fish, which being unfit for use were left to die on the shores. Thus fishing in the lakes

has been seriously injured, in spite of all that the fish commission has done to restock the waters with great numbers of small fry.

Pacific Fisheries. — The salmon of the West, abundant along the Pacific coast from Alaska to San Francisco, are the most interesting of all our fishes. These fish begin and end their lives in the fresh waters of inland rivers; but by far the largest part of their existence is spent in the salt waters of the ocean near the mouth of some river or in a shallow indentation along the coast. Salmon fisheries, extending from the Golden Gate to Puget Sound, are the most valuable in the United States, with the exception of the oyster grounds. The largest salmon canneries are situated on the Columbia River and Puget Sound. The first place in value among our true fishes belongs to the salmon. Only one other species surpasses them in the world, and that is the sea herring.



Salmon fishing in Puget Sound.

A Bit of Salmon History. — Five important varieties of salmon, ranging in size from eight to sixty pounds, with occasional specimens of over a hundred pounds, abound in the United States, especially in the streams of Oregon.

Washington, and Idaho. When the salmon are about ready to lay their eggs, they leave the salt ocean waters and start a long journey, sometimes of 2000 miles, up a convenient stream. This river is frequently the one in which they themselves were hatched. So strong are the salmon at this time that they are able to make these trips against the swiftest currents, rapids, and even over falls ten feet high. When they have reached a suitable spot, the female lays several thousand eggs, covers them in a heap of gravel, and leaves them to the mercy of nature; for both parents die even before the eggs are hatched. Most of the spawning occurs in the fall and the eggs hatch several weeks later. The chances for a salmon to develop from the egg to a full-grown fish are very small. In the first place, from three fifths to four fifths of the eggs are eaten by other fish. Of those that are hatched so many are devoured either near the home nest or on the trip to the ocean that only five or ten per cent live to reach full size. To prevent this enormous loss the Bureau of Fisheries has constructed hatcheries in which salmon eggs are secured and hatched, and the young are cared for until able to shift for themselves. As a result, eighty-five per cent of the eggs are developed into good-sized fish.

Catching Salmon. — The salmon industry began about fifty years ago. As soon as canning and refrigeration were introduced it grew so rapidly that extinction of the fish was imminent. The Columbia River fishermen work during July and August when the salmon are starting on their inland journey. Then the river is filled with the finest fish. They are caught in gill nets, traps, or fish wheels. The gill net, over a thousand feet long and forty feet wide, is stretched between the two boats across the river in the

path of the salmon. The upper edge floats on the surface of the water, buoyed up by cork, and the lower edge is held in place by weights. The meshes of the net permit the head of the fish to go through, but not the body. The gills prevent the captives from backing out. Thus the salmon are held fast until taken out by the men. In swift currents the fish are dipped up in wire nets that swing from the rim of water wheels. The wheels are fastened to piers extending from the banks of the stream; and are kept in motion by the moving water. Salmon traps are made of netting fastened to a circle of posts in the water, in such a manner that the unsuspecting fish easily finds its way into them. There they remain until removed by the men.

Canning Salmon. — All along the lower Columbia are many canning establishments where the fish are prepared for the market. As soon as the salmon are delivered at the factories they are cleaned, canned, cooked, and labeled so quickly that it almost seems to be done by magic. The head, fins, and tail are cut off. The body is scraped inside and out, and given a final washing. Then they are cut into the right lengths for the cans, which are packed and sealed by machinery. A small venthole is left in the top of the can until the contents have been cooked. The opening is then sealed; and the cans are cooled, cleaned,

Salmon canning.

and labeled. Finally they are packed in cases and shipped to all parts of the world.

Alaskan Fisheries. — The Alaskan waters are exceedingly profitable fishing grounds. Salmon, cod, and halibut abound. The seal fisheries have more than paid for Alaska. Since that peninsula and the adjoining islands were purchased from Russia in 1867 for $7,200,000, the United States government has received $9,000,000 for leases giving certain companies the privilege of catching seals in these waters.

The largest seal-breeding place in the world comprises the five rocky, desolate Pribilof Islands in Bering Sea. About the first of May the males arrive on these islands from their winter quarters in warmer southern seas. The females, called cows, arrive at the rookeries, as the seal ledges of the Bering Islands are called, about the first of

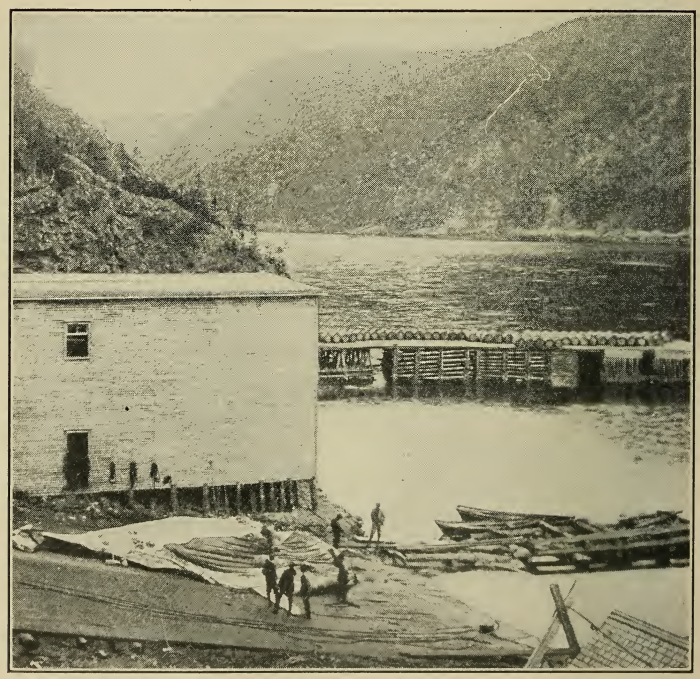
Seals on beach, Alaska.

June. The young males, known as bachelors, on arriving at the islands herd together on the outskirts of the rookeries. It is these young males that are killed for their skins. A day or two after the arrival of the females, the young seals or pups are born. A week or two later their mothers enter the neighboring waters in search of food for themselves, returning at intervals to nourish their young. The males remain on the islands until August, living on the fat they have accumulated during their winter stay at sea. Then they go to sea in search of food. The pups leave the rookeries about November.

International Seal Agreements. — Since all nations may fish without restriction anywhere in the ocean beyond the three-mile limit, a large number of seals, many of them mothers, were killed and captured in the open seas. So many were killed at sea that the extinction of these animals was almost sure to occur. To prevent this, Russia, Japan, England, and the United States signed a treaty in 1911 which provides punishment for any one who kills seals in the deep waters of the Pacific north of the thirtieth parallel of latitude. They may be killed only on land, between December and April; and no one is permitted to kill a female. By this treaty it is hoped that the number of seals will increase and that the Alaskan seal fisheries may be a permanent industry.

Whaling. — Another profitable sea animal that lives in the cold northern waters is the whale. Many people erroneously think it is a fish. The gills, necessary for a wholly aquatic life, are wanting in the whale; so it must come to the surface at regular intervals to get a fresh supply of air. Before the Civil War, whaling was an important American industry, because it yielded oil and whalebone,

two products for which there were no substitutes. The whaling headquarters then were at New Bedford, Massachusetts, and most of the whales were caught off the coast of Greenland. Lately mineral and vegetable oils have been discovered which partly take the place of the animal oil. The whalebone has been partially replaced by celluloid, rubber, and other products. These changes, added to the scarcity of whales, have greatly reduced the extent of whaling. In the meantime the headquarters have shifted to San Francisco. Most of the right whales are caught in



Cutting up a whale to obtain whalebone and oil, Newfoundland.

the Arctic Ocean, but sperm whales are captured in the Indian Ocean.

After a whale is sighted, a harpoon is shot at it from the ship or launch. The dead monster is then fastened to the side of the vessel. The fat is removed from it and transferred to the ship, where from twenty to thirty thousand gallons of oil are rendered out of it. The horny, fringed sheets of whalebone ten feet long, attached to the upper jaw, are worth from three to four dollars a pound. The sperm whale has no whalebone but is valuable for its sperm oil, which is manufactured into candles and ointments. It also yields a fragrant substance, called ambergris, used in making perfumes. The teeth often serve as a substitute for ivory.

By-products. — The chief use of fish and, indeed, most water animals is for food. But they yield many other valuable by-products as well, which give rise to a number of related occupations. For example, glue and fertilizers are manufactured from the skin, bones, and other refuse parts of fish. Fish glue is used in making court plasters, and on postage stamps. Cod liver oil is noted for its medicinal qualities. Isinglass is obtained from the swimming bladders of fish.

Future Fish Supply. — Such large numbers of fish and other water animals have been taken from our streams, lakes, and coast waters that many of our fisheries are threatened with extinction. To repair the losses already sustained and to prevent still further depletion the national government and several of the states have created fish commissions, whose duty it is to increase the quantity and improve the quality of the fish supply of the United States. The United States Bureau of Fisheries makes

careful studies of the habits and diseases of various species; for example, salmon and oysters. The rivers, lakes, and coast waters are stocked with young fish. Men gather eggs from the spawning grounds, hatch them artificially, and take charge of the young until they can care for themselves, at which time they are set free in the rivers and lakes. Fish eggs are sometimes imported from other countries so that new kinds may be developed here.

Questions

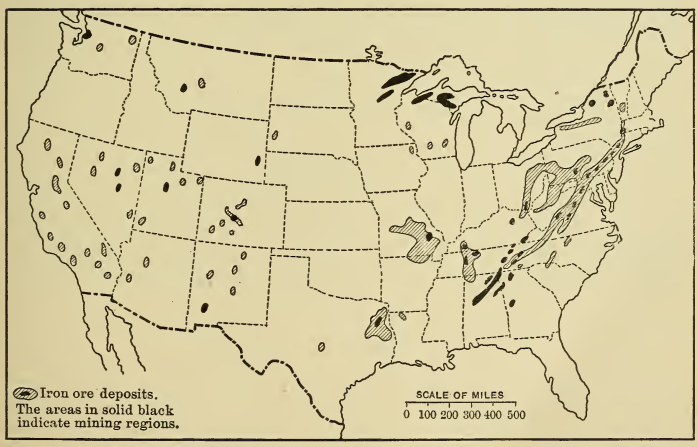
1. Which are more important, land or sea animals?
2. The food of many land animals consists of vegetation. What furnishes the food for the millions of fish in the ocean?
3. On an outline map of the United States indicate the various important fishing districts.
4. Prepare an exhibit of pictures of as many varieties of fish as possible. How do Alaskan salmon reach Chicago?
5. Describe one of your own fishing experiences.
6. Ask your marketman where his fish came from.

CHAPTER XVIII

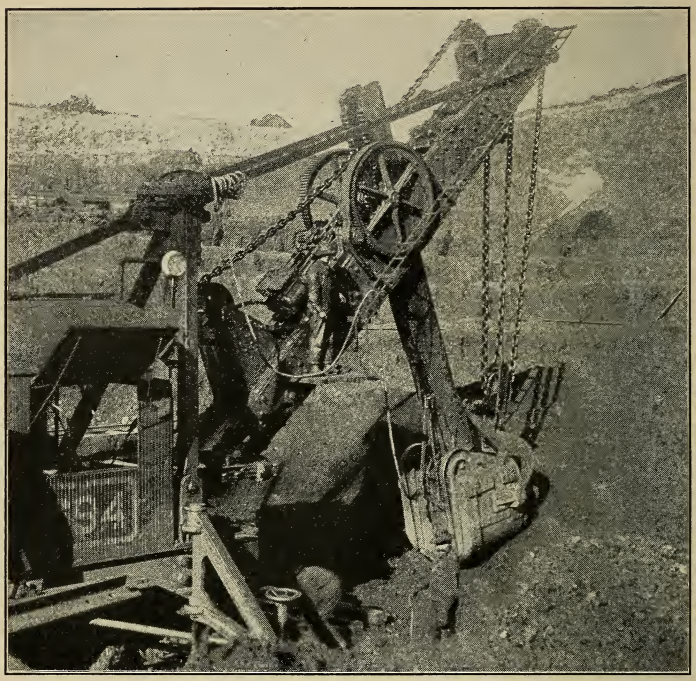
MINERAL WEALTH OF THE UNITED STATES. THE METALS

Classes of Mineral Products. — There are two classes of minerals, — metallic and nonmetallic. The first group includes iron, gold, silver, copper, zinc, lead, quicksilver, and many others. The second group includes building stone, clay, coal, petroleum, and gas.

Iron. — With the possible exception of coal, iron is our most valuable mineral. At present we are producing about one half of the world's annual iron output. Minnesota, Michigan, Alabama, New York, and Wisconsin produce about nine tenths of the total iron output of the United States.



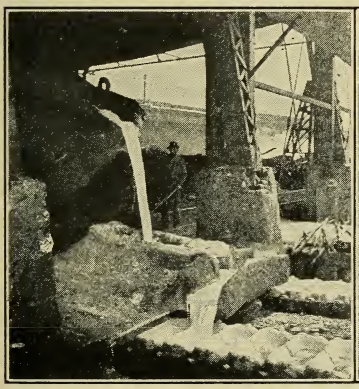
Iron ore regions of the United States.



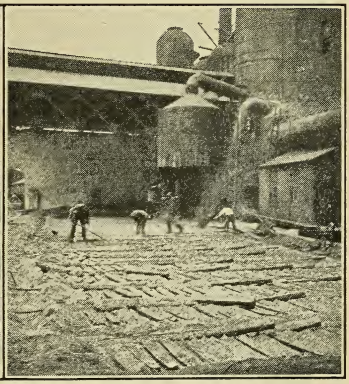
An open iron mine, Minnesota. The steam shovel is scooping up the ore and placing it in cars.

Lake Superior District. — The Lake Superior region is the greatest iron producer in the world. The iron lies so near the surface that it is mined with unusual ease and little cost. Since the close of the last century, mining machinery has been so much improved that it has largely displaced hand labor and greatly reduced the expense of excavation and transportation. Enormous steam shovels scoop the reddish ore from the open pits of the mines into freight cars, which take it to near-by lake ports. Then it is carried in vessels to iron-manufacturing cities, like

Chicago, Gary, and Cleveland. From Cleveland and other Lake Erie ports much of the ore is shipped by railroad to Pittsburgh and other neighboring cities. The Superior field lacks coal, and therefore the iron ore is shipped by water to the great manufacturing cities near the coal fields. Millions of tons of raw iron, looking very much like ordinary soil, are received by the many smelting furnaces every year. From the iron-smelting centers, vast quantities of pig iron, cast iron, wrought iron, and steel are sent out by rail and boat to Detroit, Buffalo, New York, Philadelphia, Baltimore, Cincinnati, Indianapolis, and scores of other cities where these semi-raw products are manufactured into farming implements, printing presses, stoves, sewing machines, automobiles, locomotives, ships, wire, nails, pins, and hundreds of other articles.



Molten iron pouring into the molds of a pig iron machine.

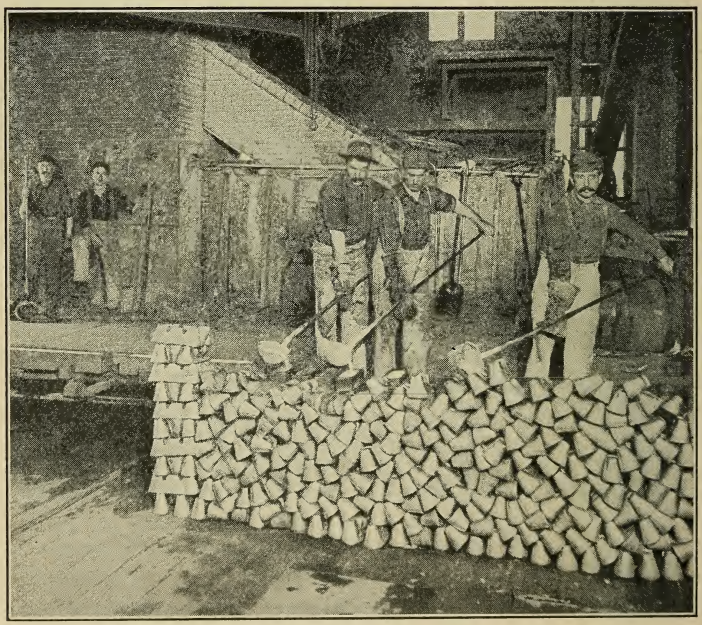


Breaking into bars the pig iron that has solidified in the grooves in the sand.

Leading Iron Cities. — Pittsburgh, in the heart of the richest coal field in the United States, carries on the greatest iron and steel business. Chicago and Gary, which lie near

the Superior iron mines just north of them and the Illinois and Indiana coal mines just south, are the next in importance. Birmingham, Alabama, is favorably located with reference to coal, iron, and limestone deposits; hence it ranks third in this class of manufactures. It does such a large business in iron and steel that it has earned for itself the name, "Pittsburgh of the South." Colorado has large deposits of limestone, coal, and iron; and Pueblo in that state is the leading city of the Western States in the manufacture of iron and steel.

Copper. — After iron, our most valuable metallic mineral



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Pouring copper into molds, Michigan. In front is a pile of ingots taken from the molds.

is copper. Next to silver, copper is the best conductor of electricity; and its chief use is for manufacturing electrical appliances. The marvelous increase in the uses of electricity has made a great demand for this metal. It is also used in the manufacture of boilers, and for roofing houses and sheathing the bottoms of ships. Copper mixed with tin makes bronze; when mixed with zinc, it produces brass.

Chile used to be the leader in the production of copper; now the first place is held by the United States. We supply more than half of the world's annual output of this metal. For a long time the shores of Lake Superior in Michigan were the greatest copper region on the globe. The metal occurs there in almost a pure state. Another important copper section is the Butte district of Montana; but the greatest producer to-day is Arizona. A large part of our annual copper output goes to Europe, mainly to Netherlands, Germany, France, and Great Britain. Our rivals in copper production are Mexico, Spain, and Japan.

Lead. — With the progress of industry and science, lead becomes more and more useful. It is employed in roofing houses, lining cisterns, making plumbing pipes, and for manufacturing metal type, shot, white lead, solder, and pewter ware. This metal is found in workable quantities in only four states: Missouri, Idaho, Utah, and Colorado. With the exception of the first, they are all in the Rocky Mountain section, where the lead is often found in lead-silver deposits. Our country produces more than any other nation, or a third of the world's annual supply of lead.

Zinc. — Zinc is a hard mineral and is generally found with copper or lead. Its hardness, together with its power

to resist the rusting effects of water, make it very useful for drain spouts and gutters of houses. Galvanized buckets are treated with a zinc solution and thus are able to render far more satisfactory service than tin buckets or even the old oaken buckets. Almost all the zinc of the world is produced by the United States, Germany, and Belgium. The United States yields about a third of the entire amount. Zinc mining is carried on in ten or twelve states, but Missouri leads them all. This state furnishes two thirds of the American product.

Mercury. — The United States produces about a fourth of the mercury of the world. From California about eighty-five per cent of the output of the United States is obtained. Texas, Utah, Arizona, and Oregon supply the remainder. This metal is the only one that, under ordinary conditions, is a liquid. The liquid in thermometers and barometers is mercury. It is also used in making the backs of mirrors, in medicines and dentistry, and for extracting gold and silver from their ores.

Aluminum. — Within the last thirty years, aluminum has been added to our list of valuable metals. It had remained practically unknown for so long a time because it is difficult to separate from the other elements with which it is usually combined. By means of electricity this mineral now is easily released from its ore, called bauxite. It is particularly valuable on account of its light weight and rust-proof quality. Kitchen utensils, suit cases, artificial limbs, musical instruments, mailing tubes, chemical utensils, and camera cases are a few of the articles made of it. The United States produces about a fourth of the world's supply, and most of it comes from Arkansas, Georgia, Alabama, and Tennessee.

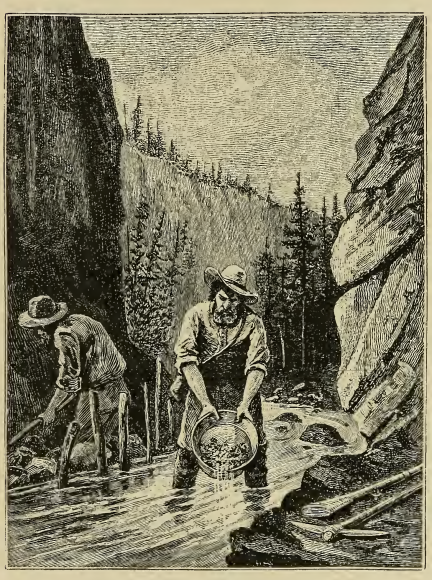
Gold. — Because of its beauty and scarcity, gold is regarded as a precious metal. It is used chiefly for jewelry and money. Men are so anxious to possess gold that they will undergo the most trying hardships to secure it. Some very extensive migrations into new lands have been due to the quest for gold and other precious metals.

Gold-producing Countries. — The leading countries in gold production are British South Africa, the United States, Australia, and Mexico. Our own country mines a little more than one fifth of the world's annual output. California, Colorado, Nevada, Alaska, South Dakota, Utah, Montana, and Arizona are the chief gold-producing areas of the United States.

Discovery of Gold in California. — In January 1848, a man named Marshall built a flour mill for Mr. Sutter, a pioneer settler near Sacramento, California. While digging a mill-race, he found in the sand some bright, shining particles which proved to be gold. This discovery caused great excitement. The gold fever spread rapidly over the country. Men rushed from all parts of the world — from New England, Mexico, China, France, Germany, Italy, and Russia — to California. There were no transcontinental railroads in those days, so thousands of men from the eastern part of the United States crossed the western plains, deserts, and mountains in canvas-covered wagons to the California gold fields. Others went by ship to the Isthmus of Panama, crossed the narrow strip of land, and then took ship again for San Francisco. Still others went in ships around Cape Horn to reach California.

The gold region was public land belonging to the Government. Each prospector, soon after his arrival, filled a pan with gravel from the river, shook and whirled it under the

water until only small specks of gold remained. If he was satisfied with the result he applied for a claim of the river front on the spot where he had made his test. The lucky prospectors made very large wages. Ordinary miners received $16 a day. The very lucky ones netted as much as $1000 and even $5000 a day. Fabulous prices were paid for food and clothing. Hotel accommodations were scant. People lived in log cabins, shanties, and tents. Board and all living expenses were incredibly high — flour $1 a pound, bacon $1.60 a pound, candles $1 each, a pair of boots $100. Letters could not be mailed in the modern sense of the word, but they were expressed at $2, $3, and $4 each.



Gold washing, California.

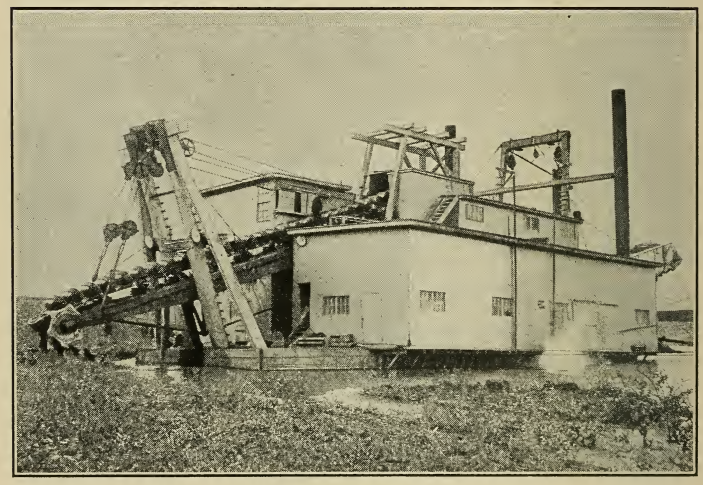
As more and more gold was found, pan-washing became too slow, and the rocker came into use. The rocker had a flat bottom, two side boards and a head board with a hopper at the upper end; the head of this contrivance was several inches higher than the foot. Earth and water were thrown into the hopper; the gold and fine gravel fell through the screen of the hopper to the bottom of the rocker, while the coarse

rocks rolled off from above. The machine was kept in constant motion. At the lower end was a riffle about an inch and a half high which caught the gold particles as the finer gravel and clay were washed down by the water. Later the rocker gave way to the "long tom," which consisted of a trough or sluiceway of boards with sides ten inches high. The water thrown into the sluiceway on the earth carried the latter down the gently slanting bottom board, which was supplied with riffles that caught and held the particles of gold, while the gravel washed away. This produced results more quickly than the rocker.

In time, canals were built from the rivers to the great gold-bearing hills some distance away. By means of pipes, large streams of water were played against the soil and gravel, forcing it into ditches or sluices. The gold settled at the bottom, while the clay and sand rolled away. This method is called hydraulic mining. While it is rather expensive because dams and flumes must be built and water mains must be laid, one man can accomplish as much by this method as thirty-five diggers.

Dredging for Gold. — The beds and deltas of many rivers are rich in gold. This is obtained by means of dredges. A gold dredge is a slow boat with an endless chain of buckets that scoop up the earth from beneath the water, removing thousands of cubic yards of earth in a day. As each bucket reaches the top of the dredge, its contents are dropped into a hopper. The mass rolls down a revolving screen, and water is constantly played upon the screen, so that the soft earth and particles of gold escape through the screen and flow over the riffle boards below. The riffles hold back the gold. The stones are

carried to the end of the screen and are thrown off in somewhat the same way as the wheat straw is carried from the threshing machine by the straw stacker. Thus great heaps of rocks and soil are taken from the earth and piled in hills. These pyramids of dredged earth are now removed by crushing the rocks and using them for roads, railroad ballast, and concrete. The remaining soil is then leveled and the tracts are converted into farm lands.



A gold dredge.

Gold from Solid Rocks. — After considerable mining had been done along the rivers, men found that there were veins of solid rock rich in gold, deep down in the earth. To get this is more difficult and costly than hydraulic mining; for deep shafts must be sunk, and hoisting engines, mining tools, and blasting materials secured. The solid rock is crushed in stamp mills and then by various means the

gold is separated from the fine particles of rock. Such mining can be done only by companies with large sums of money.

The result of the California gold fever was the rapid settling and building up of the West. Mine after mine of gold, silver, copper, and lead was discovered in California, Nevada, Montana, Wyoming, Colorado; in fact, all through the Pacific and Rocky Mountain section, until to-day this is one of the richest and most promising parts of the United States. Roads were built across the mountains, over which thousands of people traveled in search of new opportunities. The Pacific Railroad ready for use in 1869 was the first of a number of steam highways that promoted a stream of westward migration which has not yet come to its end. Soon resources other than minerals attracted strong, daring young men and women from the East. Agriculture, fruit growing, stock raising, and lumbering brought in as much wealth as the gold. Scores of prominent cities sprang into existence, among them Sacramento, San Francisco, Oakland, Los Angeles, Portland, Seattle, Tacoma, Salt Lake City, Spokane, and Denver.

Gold in Alaska. — In 1898 there was a new gold excitement. Bright yellow particles of gold had been discovered in the sands of the Klondike and other tributaries of the Yukon River. Then the cry was, "On to Klondike," and there was a mad rush to the Arctic region near the boundary of Canada and Alaska. The gold seekers took a steamer at Seattle and sailed 1200 miles along the Canadian shore to Skagway in southern Alaska. There the adventurers began a long wearisome tramp northward over the Dead Horse Trail, so named because many prospectors lost their horses here through exhaustion. By and by the men

ALASKA
SCALE OF MILES
0 100 200 300 400 500
ARCTIC OCEAN
PACIFIC OCEAN
ASIA
SIBERIA
BERING SEA
ALEUTIAN ISLANDS
GULF OF ALASKA
NORTHWEST TERRITORIES
DOMINION OF CANADA
YUKON
BRITISH COLUMBIA
ARCTIC CIRCLE
Anadir Sea
Pt. Barrow
Icy Cape
C. Lisburne
Pt. Hope
Kotzebue Sound
Cotville R.
Endicott Range
Kobuk R.
Porcupine R.
Koyukuk R.
Circle
Eagle
Fairbanks
Tanana R.
Yukon R.
Mt. McKinley
Mt. Wrangell
Mt. St. Elias
Mt. Logan
Valdez
Kenai
Seward
Cook Inlet
Kuskokwim R.
Nushagak
Bristol Bay
Katmai Vol.
KODIAK I.
Glacier Bay
CHICHAGOF
Sitka
BARANOF I.
PRINCE OF WALES
Dixon Entrance
Prince Rupert
QUEEN CHARLOTTE IS.
Wrangel
Skagway
White Horse
Dawson
KLONDIKE REGION
Rocky Mts.
Great Bear Lake
Mackenzie R.
Nulato
Nome
Solomon
Norton Sound
St. Michael
C. Romanzof
ST. LAWRENCE I.
ST. MATTHEW I.
NUNIVAK I.
C. Newenham
PRIBILOF IS.
SHUMAGIN IS.
UNIMAK
UNALASKA
FOX IS.
UNMAK
AMLIA
ATKA
ANDREANOF IS.
RAT IS.
ATTU
AGATTU
Bering Strait
C. Deshnef
SEWARD PEN.
Prince of Wales
Alaskan Mts.
L.L. POATES CO., N.Y.
East 180° Longitude 170° West 160° from 150° Greenwich 140°
160° 170° 180° 170° 160° 150° 140° 130° 120°
60°

reached the upper waters of the Yukon, glad to take boats and thus be relieved of carrying heavy burdens over rough paths. But even a sadder fate awaited them here; for some of the boats were stranded in the rapids of the river. Many lost their goods and not a few were drowned. But the more sturdy and fortunate ones finally reached Dawson, Canada, in the midst of the gold district lying in Canada and Alaska.

At first the miners washed the gold-bearing sands lying at the surface. Later, when much of the loose surface earth had been sifted, they searched underground for hidden treasures. They often found gold deposits several feet below the surface. In order to get the gold in the winter season the earth had to be thawed out with fires before the mining operations could be carried on. A few men were fortunate enough to wash out hundreds of dollars' worth of gold daily; but for the majority it meant most trying hardships and privations with no unusual returns; and in some cases disappointment was the only reward. As in the case of California, the railroad soon followed the path of the gold hunters; so now the entire trip from our western coast can be comfortably made in steamers and by rail.

Gold at Nome. — In the midst of the Klondike excitement, gold was discovered on the beach of Cape Nome, which lies on the west coast of Alaska near the entrance to Bering Strait. At once, hundreds of Klondikers packed their goods and in all possible haste sailed down the Yukon River and across Norton Sound to Nome, a small Eskimo village. This was even a richer field than the one they had left behind. Within a few days Nome had a population of 2000 men. Very shortly after the arrival of the miners, hotels, stores, banks, telegraphs, telephones, electric lights,

railroads, and schools came into existence, like mushrooms. While the sands along the beach yielded rich returns, Nome was a thriving city. In recent years it has declined in importance.

A mining camp, Alaska.

Much as gold is prized, it is only dead matter, which in itself cannot contribute one iota to human comfort. The lucky finders had to have purchasers for their yellow metal. So they took it to the United States assay office which had been put up in Seattle by the Government. This office has bought many millions of dollars' worth of Alaskan gold dust and has sent it to the mints to be coined. Gold is the third resource which has made Alaska profitable to the United States.

Other Resources in Alaska. — While gold lured men north, it is not the resource that holds them and builds up

A field of potatoes, Alaska.

the region. Furs and gold attract a floating population; agriculture builds up a permanent community. Formerly Alaska was known as a cold, barren place from which men had best keep away. Since the discovery of gold, it has been found that the climate is as good as that of Norway and Sweden. While the winters are severe in the interior, the summers are warm and well adapted in certain parts to the raising of grains, vegetables, and grass. Valuable forests are found in the southern half of the peninsula. The excellent pastures make stock-raising possible, especially of the reindeer, cattle, and sheep. Besides the gold, rich copper deposits and valuable coal beds have been discovered. Manufactures have at least made a start, and a few railroads have been built.

Our Gold-producing Districts. — The greatest gold fields in the country to-day are in Colorado. Cripple Creek, Leadville, and Denver are especially rich in silver and gold deposits. California is the second in the production of gold at present, closely rivaled by Alaska. There are four mints in the United States where gold is melted, stamped, and milled into coin; namely Philadelphia, New Orleans, Denver, and San Francisco.

Silver. — While gold is the best mineral for setting a standard of values, silver is a better metal for the making of coins, because of its greater hardness. Moreover, it is found in much larger quantities than the yellow metal. The world's output of silver is ten times as great as that of gold per year. In the last fifty years silver mining has

Silver-lead mills, Idaho.

steadily increased in our country. The chief silver-producing countries are Mexico, United States, and Canada. In the United States, Nevada, Utah, Montana, Idaho, Colorado, and Arizona lead in the production of silver. Much of the gold ore also contains silver and thus these two metals may be the product of one kind of ore. Large quantities of silver are present in copper ores, hence in copper mining, silver is an important by-product.

Questions

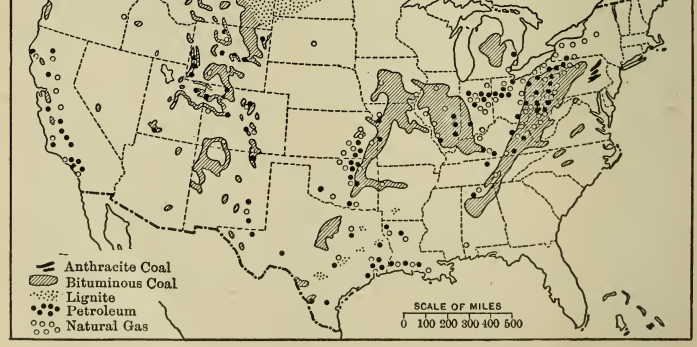
1. What properties make iron the most useful mineral?
2. What is the relation between iron and commerce? Iron and farming?
3. Write out a list of articles that are wholly or partly made of iron or steel.
4. Name the great steel centers and account for their development.
5. Collect specimens of pig iron, cast iron, wrought iron, steel, lead, zinc, copper, brass.
6. Sketch a map of the Great Lakes and the adjoining states of Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, and New York. Show routes over which iron ore passes; ports at which it is unloaded and converted into useful articles.
7. Why are so many blast furnaces and steel mills far removed from the iron mines?
8. What is the most valuable resource of Alaska? Of California?
9. Sketch a map of Alaska, and the Yukon River. On it indicate the Nome and Klondike gold districts.
10. What effect would a total lack of gold and silver have upon our industries? A lack of copper?

CHAPTER XIX

MINERAL WEALTH OF THE UNITED STATES. NONMETALLIC MINERALS

Coal, the Basis of Successful Industry. — No country at the present time ranks high in industry that does not have an abundant coal supply. The three leading modern industrial nations lead in the production of coal as well as of iron. They produce four times as much coal as all the rest of the nations together. Of the world's output in 1910 the United States produced 39 per cent, Great Britain 23 per cent, and Germany 18 per cent.

Coal Fields of the United States. — In general there are two kinds of coal — anthracite or hard coal, and bituminous or soft coal. While, so far as is known, this country

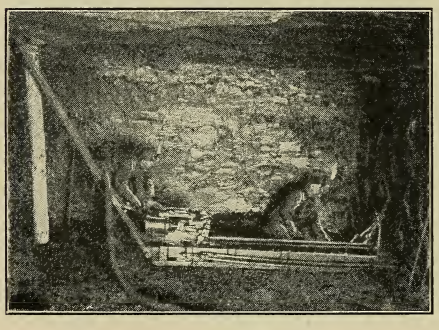


Distribution of mineral fuels in the United States.

Digging into a seam of coal at the face of a cliff, Pennsylvania.

has the largest single anthracite coal field in the world, it is only half the size of Delaware. It lies in eastern Pennsylvania. Besides this there are very small areas of it in Colorado and New Mexico. The bituminous fields are well scattered over the United States. No less than thirty states produce coal. The two leading sections are the Appalachian region and the eastern interior field lying in Illinois, Indiana, and Kentucky. The leading coal states, in order of importance, are Pennsylvania, West Virginia, Illinois, Ohio, Indiana, Alabama, Kentucky, Colorado, Iowa, and Wyoming.

Work in the Mines. — Work in the mines is all very hard, whether it be the opening of the shaft or tunnel in a new mine, the blasting of a wall of coal, the propping of the ceiling with heavy beams, the loading of the cars, or the breaking up of the hard anthracite lumps. It is doubly difficult when the miner has to work on hands and knees in a thin vein; or work while lying on his back. Sometimes the mine is damp from water that has run into it. The dangers in coal mining are serious. The miners may suffocate from mine gases; or they may be crushed by the caving in of the roof; or be drowned by an unexpected break of a wall that lets in a flood of water; or an explosion may dash them to pieces; or a fire may break out and burn them to death. Formerly little attention was paid to mine accidents; but as people have become more thoughtful of one another's welfare, laws have been passed to protect miners, and the number of accidents has decreased.

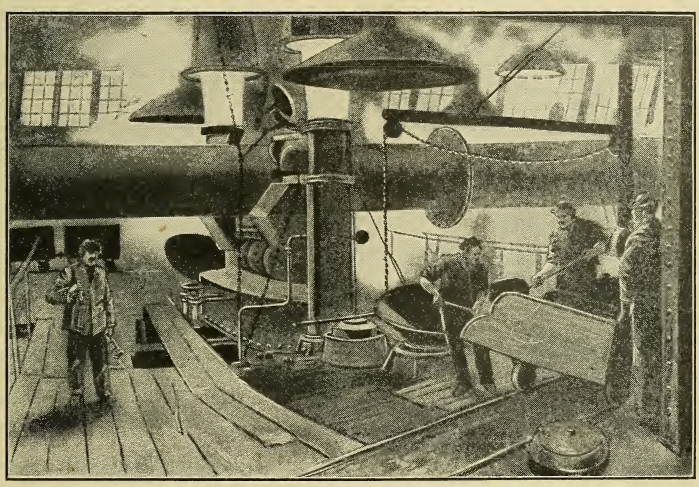


Drilling into a layer of coal.

Inspection and Transportation of Coal. — When coal is ready for the market, before it leaves the mine it is inspected by government officers whose duty it is to see that it has been properly cleaned of slate and other foreign matter. More than a million people in our country are employed in handling coal. Bituminous coal, as it leaves the mine, is run down inclined railroads and discharged

into waiting cars or barges. Freight boats, filled with this fuel, may be seen gliding over the waters of the Ohio, the Mississippi, and the Great Lakes. Railway companies that carry the coal overland, have as many as 70,000 cars devoted entirely to coal shipments.

By-products of Coal. — Only recently has man learned to secure many valuable by-products from vast quantities of material that in the past was thrown out as waste at the mouth of the mines. All the fine dust and slack which were formerly thrown away are now used in firing boilers or are burned in specially constructed grates. Coke is also



Interior of a gas plant.

manufactured from it. Illuminating gas is secured by distillation from coal, after which it is passed through water and slacked lime. When steam is passed over red hot coke a fuel known as water gas is the result. Coal tar,

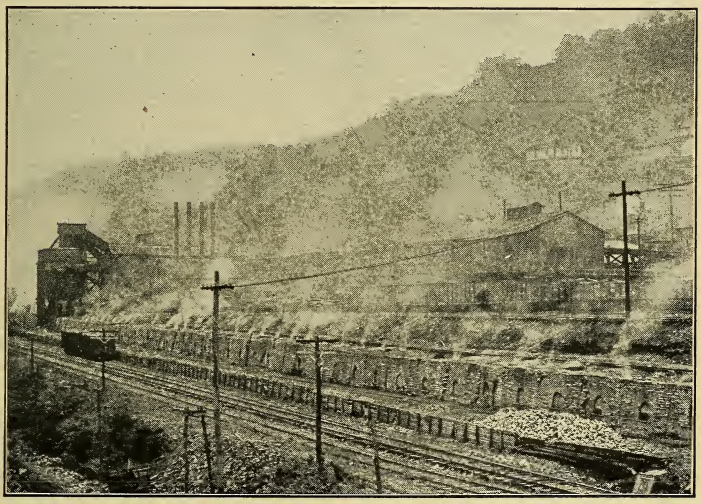
which is a by-product of coke manufacture, used to be considered worse than waste, because the men did not know how to get rid of it except to throw it into streams; and there it was a nuisance. Nowadays scores of valuable articles are made from it; such as ammonia, benzine, saccharin, dyes, red ink, disinfectant oils, carbolic acid, explosives, insecticides, photographic developers, creosote for preserving meat and wood, lubricating oils, pitch for tar paper and tar felt, and lamp black. It is coal, too, that produces part of the mineral oil that replaces whale oil and thus supplements our fishery products.

Waste in the Mining of Coal. — Probably the fact that our coal supply seemed inexhaustible has led us to be very wasteful. It has been estimated that up to 1883, for every ton of coal that was marketed a ton and a half were lost at the mine; since that date one ton has been wasted for every ton used. Sometimes thin layers of coal are interspersed with layers of shale. Such beds have been left because it was too much trouble to handle the shale. As a rule in the past any stratum of coal less than three feet thick has not been mined. Of course that means an enormous waste. Sometimes when several veins occur in the same place, the lower ones are worked first; then those above cave in and are so crushed that it is impossible to extract the coal of the higher seams from the debris. Explosives used to loosen the coal crumble a large quantity of it and cause great loss thereby.

Waste of Coal in Factories and Power Houses. — If the coal in the furnaces of our factories, stores, and large public buildings were properly burned there would be little or no smoke. The smoke is unburned coal. In the form of soot and smoke we are driving about 20 per cent of the fuel

that is thrown into the furnace out through the chimney without the least return to us. On the contrary there is great injury to our health. Many American families, perhaps all those using coal, are wasting some by overfeeding the stoves and furnaces, heating more rooms daily than are in use.

Waste of Coal in the Manufacture of Coke. — In the United States a large amount of coal is wasted in the

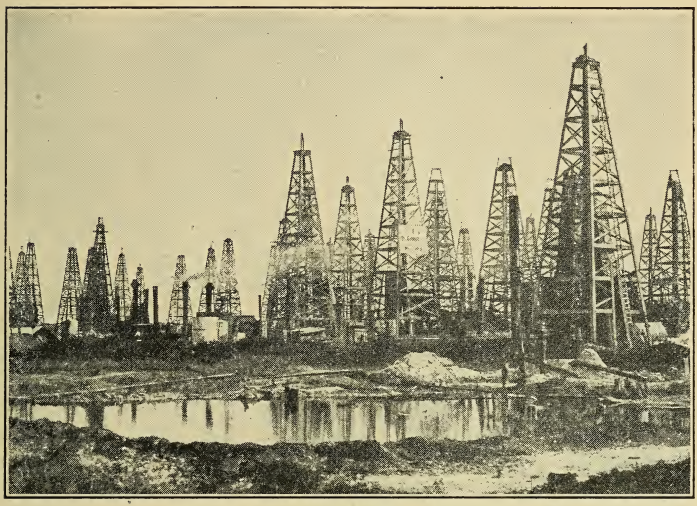


Coke ovens, West Virginia.

thousands of poorly constructed ovens in which coke is manufactured. Other countries, such as Germany, manufacture their coke in ovens that not only increase the quantity and improve the quality of the coke, but yield ammonia, tar, and gas as by-products. If all our ovens were of this modern type, millions of dollars would be saved annually.

Government Coal Lands. — Early in the history of our country, the government sold public lands for little or nothing, irrespective of whether it was farming or coal-bearing land. The loose laws made it possible for groups of individuals, forming a corporation, to acquire immense areas of coal fields at a trifling cost. This put a great resource into the hands of private owners at ridiculously low prices. To-day the government is classifying the public lands as agricultural and coal bearing. This work is being done by the United States Geological Survey. As the task requires several years, large tracts of public land are withdrawn from settlement or sale, until the Geological Survey can classify them and give some definite information as to their true value. When that is done, the coal lands are sold at prices more nearly proportional to the worth of the coal.

Government Ownership of Coal Lands. — It has long been suggested that coal lands should be held by the United States government, and leased to private concerns at a specified royalty. By this method the government revenue would be increased, and the coal supply would probably last longer. In 1912 the government tried for the first time the plan of leasing a coal mine instead of selling it. A mine of 2480 acres in Wyoming was leased for ten years to a private company at the rate of six and a half cents a ton on all coal mined during the first five years, and eight cents a ton for the remaining time of the lease. In order to promote the safety of the miner and prevent the waste of coal this mine must be operated according to rules prescribed by the Bureau of Mines at Washington. This is an experiment whose purpose it is to make coal mining in America as safe as it is in Europe.

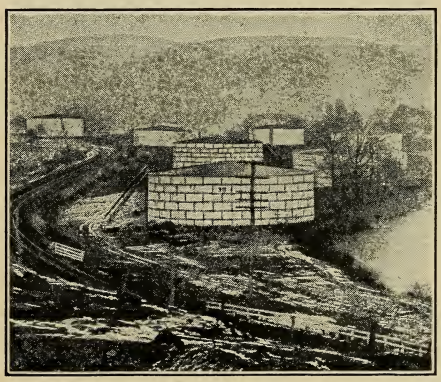


Oil wells.

Petroleum. — Petroleum, or coal oil, has been used only a few decades. But to-day the world produces several hundred million barrels of it annually. Three fifths of it is obtained from the United States. Russia is our rival, producing half as much as we do. Petroleum occurs in porous rock or in pockets in the earth, from which it is pumped out. Kerosene, used for light, was the first product derived from petroleum; but recently many other profitable products have been extracted from this mineral. Gasoline, naphtha, benzine, paraffin, and vaseline are made from it. A large amount of crude petroleum is used as fuel in locomotives in some parts of the country.

Petroleum Districts in the United States. — The United States has six large petroleum districts: (1) Appalachian; (2) Ohio-Indiana; (3) Illinois; (4) Mid-Continent, which

includes Kansas, Oklahoma, and northern Texas; (5) Gulf, which consists of Texas and Louisiana; and (6) California. In the quantity of petroleum produced, Oklahoma is the leading state. For many years after its use had become known, petroleum had only a local market. This was due to the difficulty of shipping a combustible liquid. Now pipe lines, hundreds of miles long, carry the oil from the field to distant ports and markets. In addition, the recent improvements in methods of transportation have given oil a world-wide market. American petroleum is sold in many foreign countries.



Oil tanks.

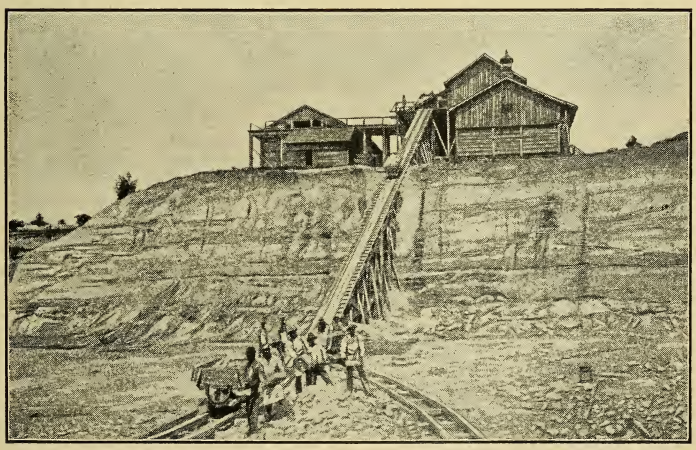
The supply of oil in the areas east of the Mississippi River is declining. It is only a question of time when all petroleum territory will cease to yield. To prolong the period of supply, we must learn to be economical in its use for fuel, light, and lubricants. If the United States wishes to insure large oil supplies to future generations, she must restrict the present exportation to foreign countries. Finally perhaps public oil lands should be leased rather than sold to private corporations.

Natural Gas. — This fuel is frequently found with petroleum. It has been in use even a shorter time than the oil, because at first people considered it a misfortune to find it present in the oil wells. In 1874 a Pittsburgh iron mill

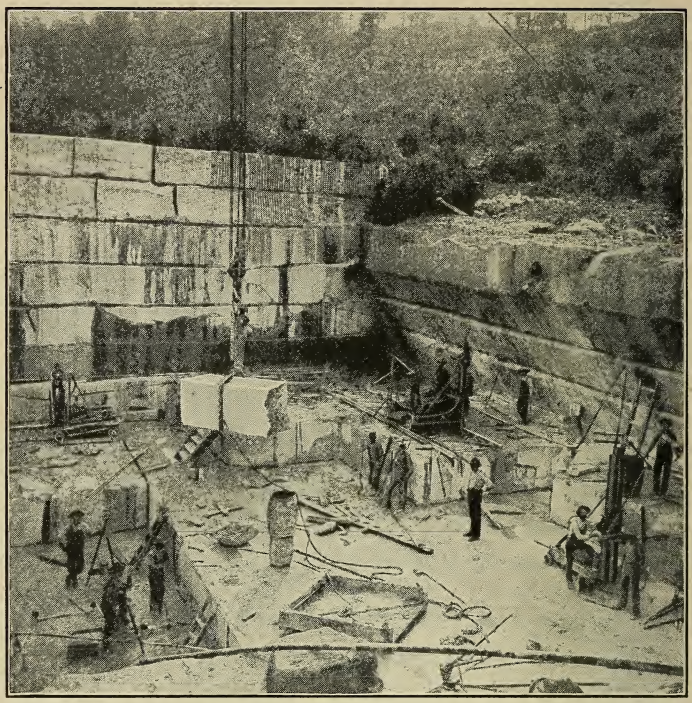
made the first industrial use of gas in this country. Due to the enormous waste and extensive use in manufacture and domestic heating, many of the gas fields are almost exhausted. At present the leading gas states are Pennsylvania, West Virginia, Ohio, Kansas, Oklahoma, and Indiana.

Clay, Sand, and Stone.—Clay, from which brick, tile, and pottery are made; and sand, used in the manufacture of glass, mortar, and concrete, are two of our most valuable nonmetallic minerals. The United States has almost every variety of these products in inexhaustible quantities. These minerals owe their importance to the great demand for them by the building trades. We are fortunate in having every state well supplied. Ohio, Pennsylvania, and New Jersey are noted for the fine quality of their clays.

In rock, such as granite, marble, sandstone, and limestone, this country is very rich. All are used for building



A clay mine.



A marble quarry.

purposes. Marble is especially adapted to ornamental and monumental work; the hard granite makes excellent paving blocks and curbstones; sandstone is used in the construction of fine buildings; and limestone is used to make roadways, railroad ballast, and lime. Manufactured cement consists of three parts of lime and one part of clay. The best limestone is found in Pennsylvania, Indiana, Illinois, and New York; excellent granite comes from Massachusetts, Vermont, Maine, Connecticut, Pennsylvania, and California; Pennsylvania, New York, and Ohio lead in

sandstone; Vermont, Georgia, and Tennessee excel in marble.

Mineral Fertilizers. — There are rich deposits of phosphates in South Carolina, Florida, Tennessee, Arkansas, and Kentucky. While workable deposits of potash and nitrate salts have not yet been found, scientists are searching for them in the deserts. If such minerals are found the United States will no longer be compelled to import potash salts from Germany and nitrate from Chile.

Conclusion. — Iron and coal are the most useful minerals. Iron or steel is used in the construction of buildings, bridges, railroads, ships, engines, cars, and thousands of other things that require a material of great strength and hardness. Coal is the mineral that enables us to defy the cold of winter, and furnishes the power that turns the wheels of factories, draws railroad trains across continents, and propels ships around the world. The United States, Great Britain, and Germany, leading in the production of these two minerals, are the foremost nations in manufacturing and commerce.

Questions and Exercises

1. Why is manufacturing a prominent occupation in coal regions? Why is not the coal carried to the iron deposits?

2. Why do nations with large coal deposits lead the world in industry and commerce?

3. If convenient, visit a mine, a coke oven, an oil well, a pottery, a quarry, or a tile factory.

4. What difference would it have made in the industrial development of our country if the Appalachian Mountains contained only gold and silver, and the Rockies were rich in iron and coal?

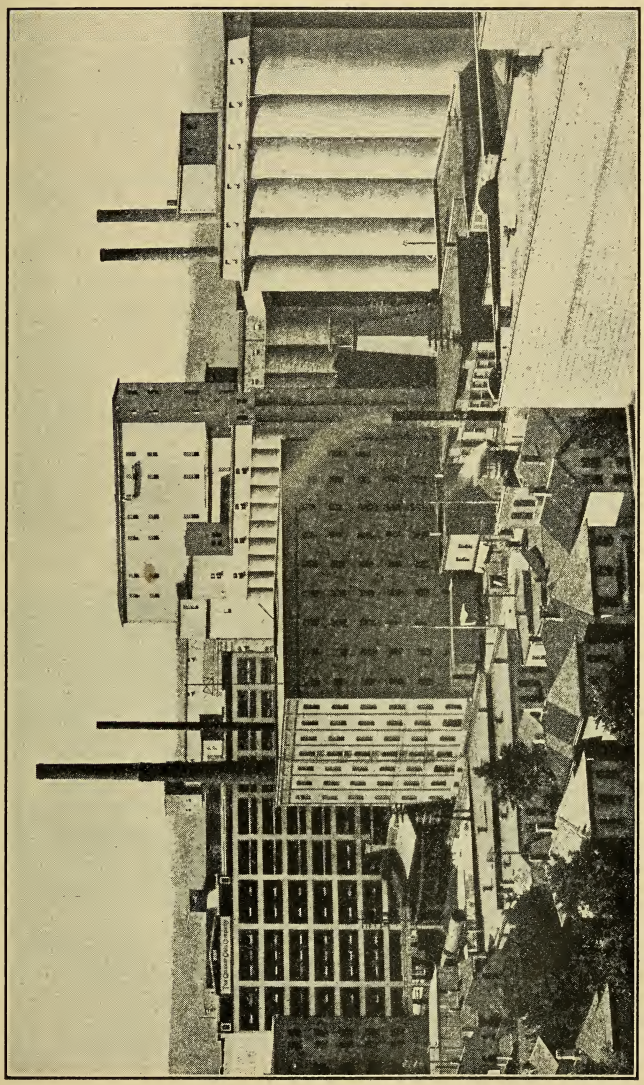
CHAPTER XX

INDUSTRIAL MIRACLES OF THE AMERICAN FACTORY

Growth of Manufacturing in the United States. — In the early history of our country there was very little manufacturing. Most of the manufactured articles, such as clothing and tools, required in the daily life of the common people, were made in their homes. The rich imported fine clothing and articles of luxury from Europe. Until the middle of the nineteenth century our manufactures were unimportant. But by the close of that century the manufacturing spirit had taken hold of Americans. The disastrous results of the Civil War had been largely overcome by 1880. The population was increasing very fast, and the West was being opened up. These conditions increased the demand and stimulated the factories to extend their output. To-day the United States is the leading manufacturing nation of the world.

Variety of Manufactures. — Our manufacturing industries may be roughly divided into fourteen groups or classes of articles: food products; textiles; iron and steel; lumber and its manufactures; leather and its products; paper and printing; liquors and other beverages; chemicals; clay, glass, and stone products; metals, other than iron and steel; tobacco; vehicles for transportation; shipbuilding; and miscellaneous industries.

These occupations are scattered over the United States, but the great manufacturing district is in the northeast. New York, Pennsylvania, Illinois, and Massachusetts are



An oatmeal mill, Cedar Rapids, Iowa.

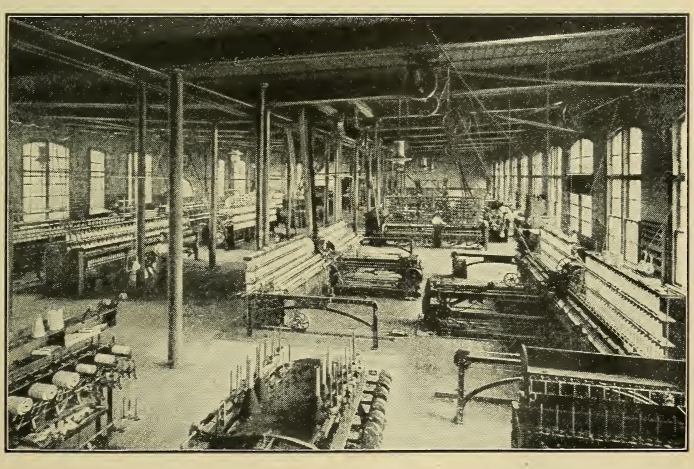
the four leading manufacturing states. The states east of the Mississippi and north of the Ohio River and the Mason and Dixon line employ three fourths of the factory hands of the country and produce three fourths of the value of the products.

Food Products. — The value of food products is greater than that of any other class of manufactures. Agriculture is the chief source of raw materials for the manufacture of food. Farm animals furnish nearly all of the meat products. Dairy cattle yield dairy products. Our grain crops supply flour and other cereal foods. Vegetables and fruits are the raw materials of the canning and preserving industry. Meat packing is the most important of the food-manufacturing industries. This industry is centered mainly in Chicago, Kansas City, Omaha, Indianapolis, St. Louis, St. Joseph, and Cincinnati. In the East, Buffalo and New York are important centers of meat packing. Fifty years ago nearly all the butter and cheese was made on the farm; to-day creameries, cheese factories, and condenseries have transferred the greater part of the manufacture of dairy products from the country to the city. The greatest dairy interests are in the Middle Atlantic and North Central States, which produce two thirds of this class of foods. Wisconsin and New York are the two leading dairying states. The North Central States which lie in the grain belt have the largest flour-milling industry: Minneapolis, near the great wheat region and with fine water power at hand, has become the world's great milling center. New York, Buffalo, Milwaukee, and Kansas City also rank high in flour milling.

The manufacture of sugar from sugar cane and sugar beets is an important industry. Raw sugar is manufactured

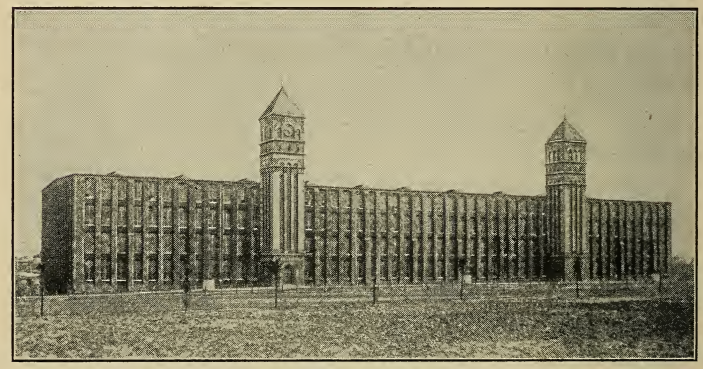
in the cane-growing sections and then is shipped to refineries in large seaports and made into refined sugar. Much raw sugar from Cuba and Hawaii is shipped to these refineries. The beet sugar ready for use is made in factories located in the beet-growing districts. Canned vegetables and fruits, canned oysters and fish, smoked and dried fish, pickles, dried fruits, preserves and jellies are some of the leading foods that are supplied by the canning and preserving industry. California leads in fruit canning; Maryland in tomatoes; Wisconsin and New York in peas; Illinois and Maine in corn; New York, New Jersey, and Maryland in sealed oysters; and Washington in canned salmon.

Textiles. — Clothing ranks second in importance and third in value among the necessities of life. More people earn a living by manufacturing cotton cloth, hosiery and knit goods, carpets and rugs, oil cloth and linoleum, silk and silk goods, woolen and worsted goods than by any other class of articles.



Textile school, Lowell, Massachusetts.

The moist climate and the abundant water power furnished by the rapid rivers have helped to give New England the first rank in cotton manufacture, with Massachusetts leading all the states. Recently the Southern States have built cotton mills, which are doing a flourishing



A large cotton mill.

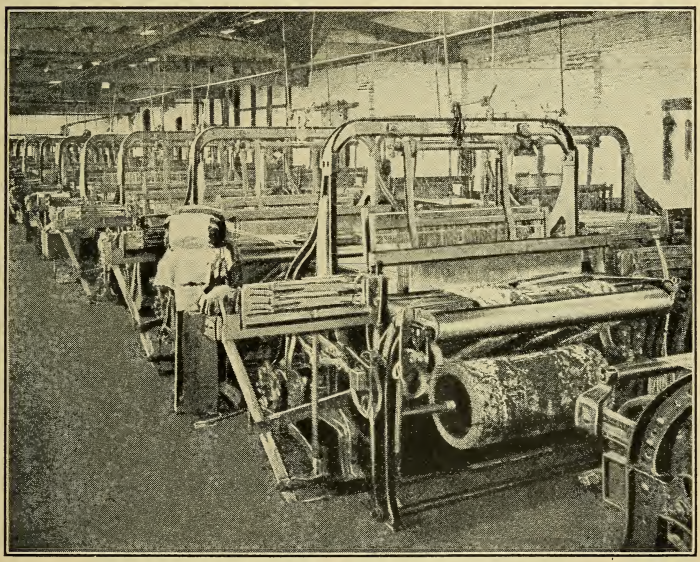
business. With coal and iron in the heart of the South, with a large amount of water power, and cotton growing in almost every part, in time there will probably be as great textile manufacturing centers in the South as the New England cities of Boston, Manchester, and Fall River. The Carolinas, Georgia, and Alabama may even surpass Massachusetts and Connecticut.

The woolen manufactures of the United States include worsted and woolen goods, hosiery, knit goods, and carpets. Foreign lands with extensive grazing areas, such as Argentina, South Africa, and Australia, supply much wool for our mills, which are yearly increasing their output of merinos, broadcloth, cashmeres, serges, and woolen yarns.

These are made into men's and women's woolen suitings, underwear flannels, knit shawls, blankets, and carriage robes. Much wool is used in making mixed cloths of cotton and wool, or silk and wool. The woolen factories, like those of cotton, are thickly clustered in the Northeastern States, including all of New England and the two adjoining states of New York and Pennsylvania.

Primitive spinning.

The leading clothing manufacturing centers are New York, Philadelphia, Chicago, Cincinnati, Boston, and



Carpet looms.

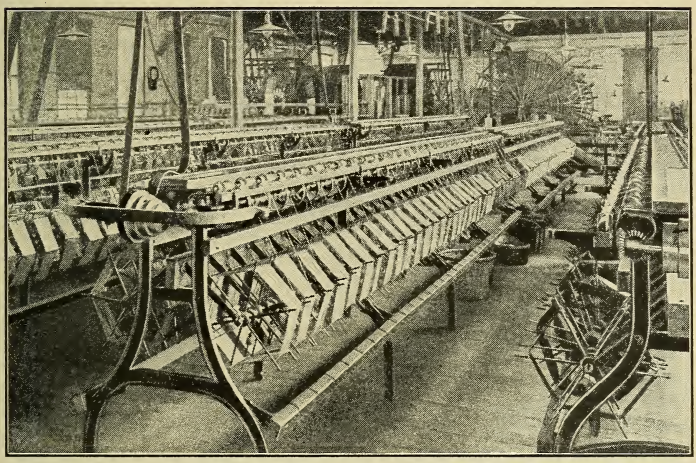
Baltimore. The United States takes high rank in the manufacture of carpets and rugs. Cohoes, New York, is a great center for the manufacture of underwear. Troy is noted for the manufacture of collars and cuffs, and Philadelphia is the largest manufacturer of hosiery.

Silk Manufactures. — As early as 1624 attempts were made to introduce the industry of raising silkworms into Virginia. Since then, many efforts have been made in various parts of the country, sometimes with the aid of government bounties, to start silk raising in this country, but with slight success. Failure has been due largely to the tedious hand labor required, and the high wages demanded in America. We cannot compete with Europe and Asia where labor is cheaper than in our own country.

Although the raising of silk has resulted in failure in this country, the manufacture of silk goods has been so successful that the United States to-day is the second silk-manufacturing country in the world, surpassed by China only. We manufacture more than France, Italy, and Switzerland combined. The greatest number of American silk factories are in Pennsylvania, New Jersey, New York, and Connecticut, but there are factories in many other states, especially in the South and West. The story of silk manufacture is a long one. Even after a piece

Silkworms feeding.

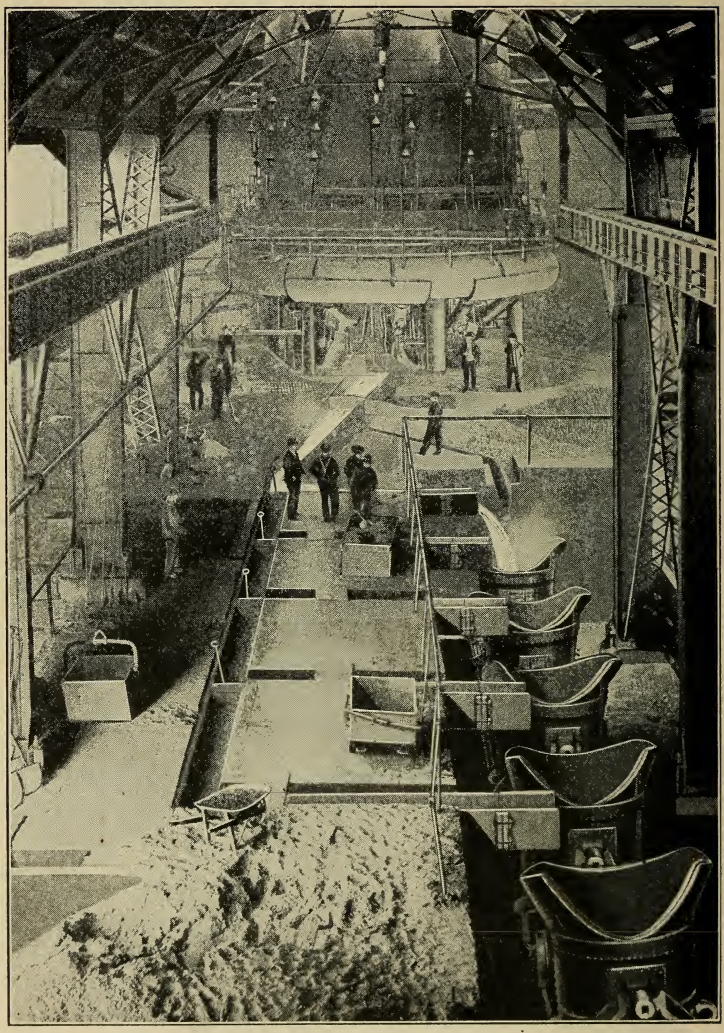
of goods has been woven, it must be treated and handled from fifty to one hundred times before it is ready for the consumer.



A silk mill.

Iron and Steel Products. — The United States leads the world in the manufacture of iron and steel. About 90 per cent of the iron and steel industry is carried on in Pennsylvania, Ohio, Illinois, and Alabama. Pittsburgh, Cleveland, Chicago, and Birmingham are the chief centers in these states. New York City, St. Louis, Gary, and Buffalo also are noted for their iron industries. The greatest iron and steel city is Pittsburgh.

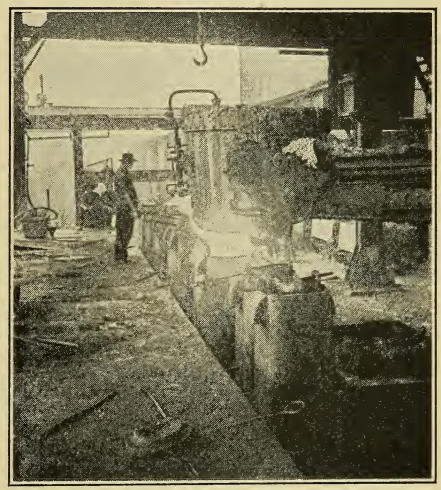
A large number of industries use iron and steel in the manufacture of important products. Some of these products are metal-working machinery, structural iron and steel used in bridges and buildings, locomotives, rails, plows, seeders, harvesting machines, windmills, printing



Running molten iron from the blast furnaces into ladles which transport it to the steel mills where it is made into steel.

presses, sewing machines, typewriters, safes, tools, hardware, wire, and cutlery. These are only a few of the uses of iron in modern life.

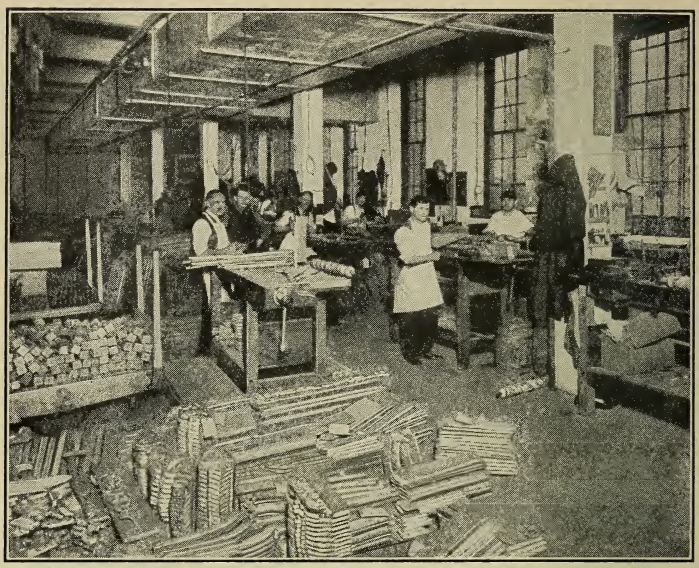
The United States has some of the largest shipbuilding plants in the world and in these much steel is used. Some of them are at Philadelphia, Baltimore, Bath, and San Francisco; there are many locomotive factories in Philadelphia, Scranton, Pittsburgh, Providence, and Paterson. American engines are sent to England, France, Scandinavia, Siberia, and other countries. Farming implements are exported to Argentina, Australia, Canada, and Europe.



Pouring molten steel into ingot molds.

Products of Metal other than Iron and Steel. — Many industries utilize metals other than iron and steel. They have mostly to do with the smelting and refining of lead, zinc, and copper; the refining of gold and silver; the making of brass, the rolling of copper; and many secondary occupations, such as manufacturing silver and brass ware, and watches and jewelry. Copper products are the most valuable, because this metal plays a prominent part in the modern uses of electricity.

Wood and its Manufactures. — A large number of in-



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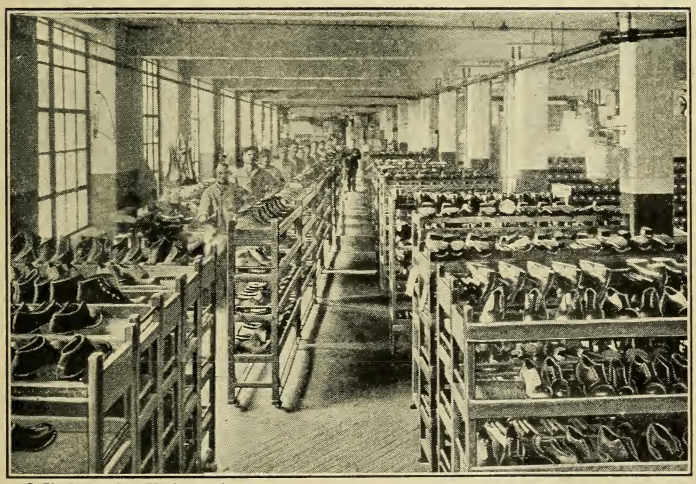
Furniture factory, Grand Rapids, Michigan.

dustries of the United States depend upon the timber camp and lumber mill. The rough lumber, after it leaves the forest, is worked over into furniture, houses, boxes, wagons, agricultural implements, and ships. Leading furniture cities are New York, Chicago, Philadelphia, and Grand Rapids. A large quantity of wood is converted into wood pulp, which is used in the manufacture of paper. Perhaps the people of no other country read as many papers, magazines, and books as those of the United States, therefore printing and publishing make a very heavy drain upon wood pulp and paper. Most of the products of paper making and printing come from New York, Illinois, Pennsylvania, Massachusetts, Ohio, and Missouri.

Chemicals and Similar Products. — Chemicals are important products of American manufacture. Some of the leading chemicals and allied products are petroleum, gasoline, coke, artificial gas, paints, turpentine and rosin, gunpowder and other explosives, acids, dyestuffs, starch, soap, wood alcohol, and drugs and medicines. Most of the products of this industry are manufactured in Pennsylvania, New York, New Jersey, Ohio, and Illinois.

Leather and its Products. — Several branches of industry receive their raw materials from tanneries in which hides and skins are tanned and made into leather. The United States turns most of its leather into shoes, in the manufacture of which she ranks higher than any other country. The New England States make more than half of our boots and shoes. Massachusetts outstrips all others in this business; but the Western States are coming into promi-



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A shoe factory.

nence. Lynn and Brockton in Massachusetts are the greatest shoe-manufacturing centers, while New York, Philadelphia, Chicago, Cincinnati, and St. Louis have many shoe factories.

Clay, Glass, and Stone Products. — Our enormous increase in population and industries requires the erection of a very large number of buildings. The demand for fireproof structures and the scarcity of lumber, due to the disappearance of the forests, are leading to the extensive use of clay, glass, and stone products. Most of our new buildings are made of brick, concrete, or stone. Concrete, which is so largely used to-day in construction, is an artificial rock made of gravel or crushed stone, sand, and cement.

Bricks, drainage tiles, sewer pipes, terra cotta, and pottery are the chief products made of clay. Ohio, Pennsylvania, New Jersey, and New York lead in the manufacture of our clay products. Most of the fine pottery used in this country is imported. In the manufacture of glass, Pennsylvania, Indiana, and Ohio are the leading states. It is hard to realize how much glass and clay products contribute to our daily welfare. It will prove interesting to make a list of all the articles you can name that are made of glass or clay.

Ships and Vehicles. — The transportation over land and across seas of the many articles required in modern life gives rise to more than a dozen manufacturing industries. They include the making of carriages and wagons; sleighs and sleds; baggage, express, and refrigerator cars; passenger cars, sleepers, and diners; electric street railway cars; bicycles, tricycles, and automobiles; and finally river craft, and ships of many kinds.

The development of the gas engine in the last two decades has brought us many new transportation conveniences. From petroleum, gasoline is distilled. This liquid has to a great extent taken the place of steam power and completely changed our transportation vehicles in the twentieth century. The gasoline engine has given us automobiles, motor cycles, motor boats, and aëroplanes.

The first automobile show in America was held in 1900 in New York. In 1901 the first transcontinental automobile trip was made. In the same year the motor cycle was brought out. The motor boat too appeared; but was looked upon as a doubtful and dangerous addition to our water craft. At that time the general public did not believe possible a machine that could fly successfully through the air. Now our waters are rippled by numerous motor boats, and men travel through the air, many thousand feet high, on voyages hundreds of miles long, in aëroplanes propelled by gasoline engines.

A motor truck.

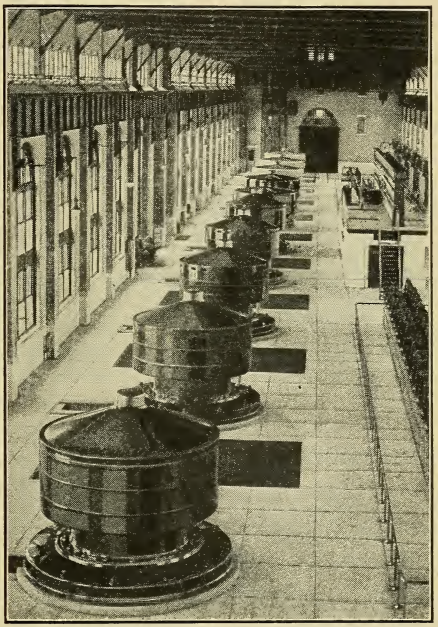
For several years after the automobile appeared, it was looked upon merely as a pleasure device for the rich; but now it is used more and more for commercial purposes. The large trucks of express companies and department stores carry six-horse loads with greater speed than would be possible for animals. Many truck farmers use motor

trucks to carry their produce to the cities. Auto-ambulances are used to render quick service to the sick and injured. Heavy gasoline-driven trucks, 40–60 horse power, are used by fire departments.

The motor cycle can carry from 300 to 500 pounds of freight, and so is helpful in delivering parcels. Being smaller, it can go where automobiles cannot. It has stood the test of riding uninjured over many miles of railroad ties; and of finding its way through bad roads. It is said to be the fastest vehicle on wheels in existence. There is a large demand for it in business circles. The motor cycle is useful to policemen, letter carriers, messengers, collectors, inspectors, country doctors, and traveling salesmen. It is of great value to the small poultry raiser and the truck farmer. For marketing their goods, it is cheaper than the horse. No wonder that motor cycle factories are enlarging their plants to meet the ever increasing calls for this vehicle.

Alcohol Motors. — The sources of gasoline are coal and petroleum. As long as the earth supplies these, gasoline will be an important fuel and source of motor power. But already men are thinking about what must be done when the black diamond and the mineral oil are exhausted. One solution of that problem lies in the manufacture of alcohol from potatoes and other plants that contain a large amount of starch or sugar. The alcohol thus obtained can be used in place of gasoline in engines. In the future alcohol for motors may be profitably manufactured by the fermentation of the sugar in the waste products of the cane-sugar and beet-sugar factories and from potato culls and other starchy plants. The starch in such plants must first be converted into sugar which is then fermented for the production of alcohol.

Manufacturing by Electricity. — The greatest of all miracles of twentieth-century manufacturing is the development of electrical industries. Thousands of American factories have changed from steam to the magical electric current generated by the falls and rapids of rivers. This mysterious harnessing of rivers to the service of man is producing wonderful results. Much of the energy of Niagara Falls has been converted into electricity, which, carried by wires, serves as power in Buffalo and in cities a long distance away. Electric power used in Syracuse comes from Niagara Falls, 165 miles away. Buffalo, industrially great as it was before, is many times greater since the Falls have been harnessed. By means of electricity generated by them, southern rivers make possible many busy mills in the land of Dixie, where the cotton grows. A large amount of power used in Los Angeles is generated at the Kern River, 125 miles away. Many other California cities and many cities in Oregon, Washington, Colo-



Dynamos at Niagara Falls.

rado, and other Western States receive electric power that has been generated from mountain streams. One of the largest water-power plants in the world is located at Keokuk, Iowa. In order to utilize the water for the production of electricity a large dam has been built across the Mississippi. From this place electric energy is distributed to St. Louis and other neighboring cities.

Millions of houses and other buildings are lighted by electricity. The fact that most lights are turned out from dawn to twilight causes a certain amount of idleness in the power houses during the day. To induce people to use

Keokuk Dam across the Mississippi River.

more electric energy in daytime, lower rates were offered from sunrise to sunset. Men at once began to devise new applications of electricity. The ice in refrigerators was replaced by cooling machines operated by the electric current. Households were equipped with electrical cooking apparatus. Even washing and ironing are done by electricity, and this same force is used to run the vacuum cleaner.

Conclusion. — American citizens are masters of hundreds of complicated branches of manufacturing. Compare that with the power of the Indians to make skin tents, beads of wampum, blanket clothing, mocassin footwear,

bows and arrows, birch bark canoes, a little crude pottery, and the peace pipe.

When the thirteen colonies declared themselves an independent nation on July 4, 1776, they were far behind the mother country in the arts of manufacturing. But they struggled ceaselessly and untiringly with the wonderful resources that nature had scattered bountifully over the American continent. To-day the factories of the United States turn out almost twice as great a production as those of the United Kingdom. Lest in our pride we forget, let us remind ourselves that the United States is twenty-four and a half times as large as the United Kingdom. While it may be pleasant to know that our country is now the leading manufacturing nation on earth, we must remember that its area and natural resources are equal to those of the entire continent of Europe, — all of which means that the future has a right to expect more of us than we have accomplished in the past.

Questions and Exercises

1. Define manufacturing, factory.

2. What is the difference between a raw material and a manufactured article? Illustrate by a food, an article of clothing, a piece of furniture.

3. Prepare a large card exhibit of specimens of cotton cloth. Of woolen cloth.

4. Make as large a list of food products as you can. Of wearing apparel. Of furniture. Opposite each article write the name of a place where it may have been made.

5. Tell how you manufactured an article; for example, a sled, a toy, a box, a stocking, a loaf of bread.

6. Fully describe the processes required to produce some article that you know about; for example, a chair, a pin, or ice.

7. Prepare a list of all the manufacturing industries you can think of.

8. How have the size and surface of our country influenced the invention and use of farming implements?

9. Why are the factory industries in wood decreasing and those of iron increasing?

10. With what chemical are you familiar? How useful is it?

11. Write up one or more of the factories of your town or some other city. Name articles made, the sources of raw materials, the factory processes. State reasons for the factory's location and success.

12. Why have the New England States excelled so long in textile manufactures? The Lake States in iron and steel? The Central States in meat products?

13. Name articles that were formerly made of wood but are now constructed of iron.

14. What advantages has a seaport factory over an inland factory? Has it any disadvantage?

15. Name all the vegetable, animal, and mineral oils you can and state the use of each.

16. By means of cross-shaped marks of various colors, show on an outline map of the United States the chief centers for the manufacture of the following products: shoes, red; textiles, blue; iron and steel, green; meat, yellow; flour, brown; refined sugar, black.

CHAPTER XXI

DOMESTIC EXCHANGE OF GOODS IN THE UNITED STATES

Early Transportation by Water. — When our country was first settled, the rivers and coast waters were the chief transportation routes. Nearly all of the early settlements were made near the mouths of navigable rivers, and the inland movement of the colonists followed these streams. Thus the settlements were connected by water with one another and with Europe. The hunters and trappers followed the rivers and lakes far into the interior of the country and these waterways carried the furs and pelts down to the coast towns.

A primitive means of transportation.

Settlers crossing the Great Plains.

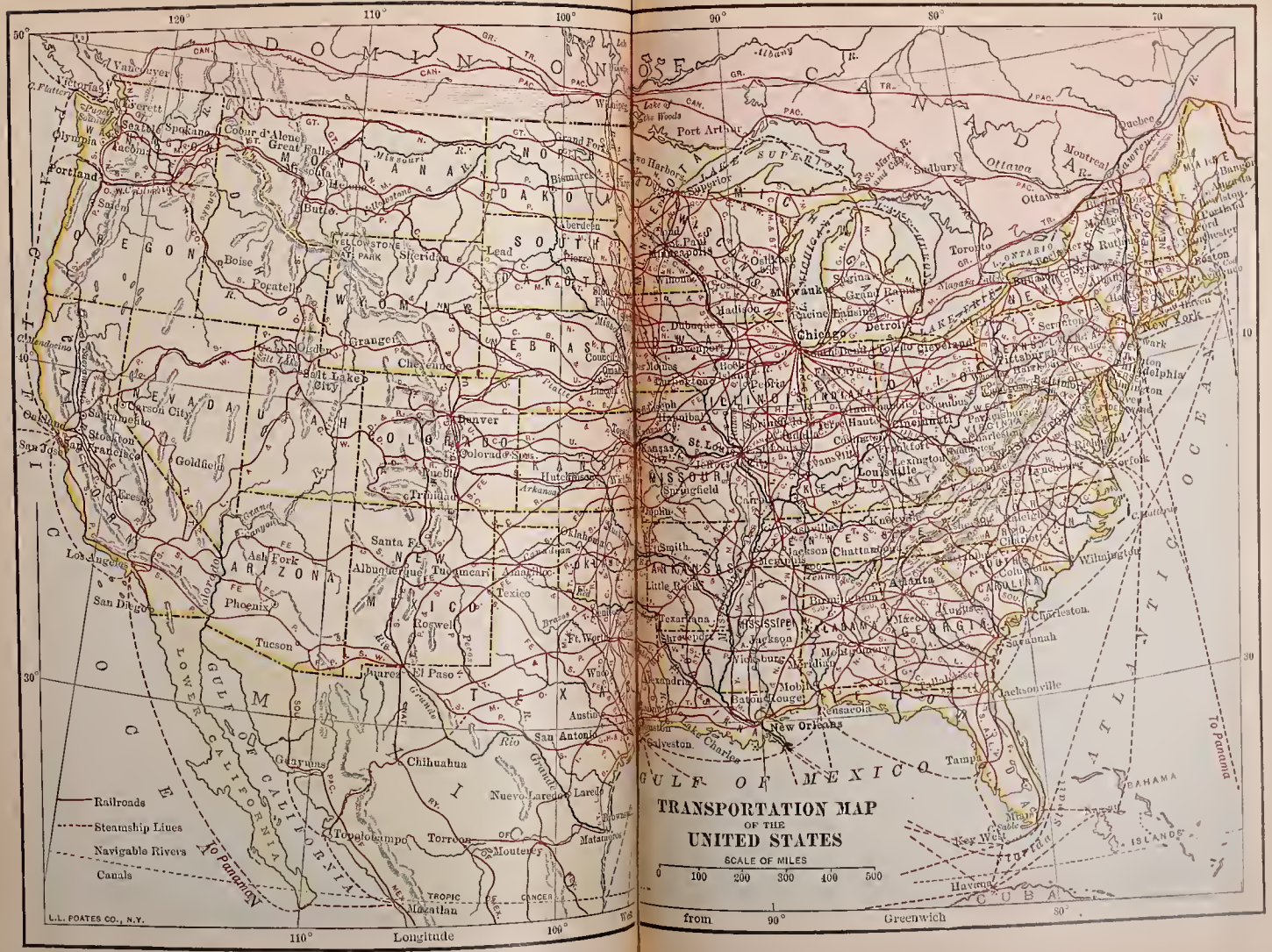
Early Roads. — The earliest settlers found only Indian trails in the wilderness. For years they could do little to improve the primitive routes. Sometimes footpaths were enlarged to bridle paths, and these in turn were widened into wagon roads. In time well-made turnpikes gave considerable impetus to travel. In 1639 the Massachusetts General Court ordered each town to build a highway to its neighboring town. As late as 1804, most of the trip from Boston to New York had to be made on horseback. Building roads in colonial times was very difficult, because of the wilderness, want of money, and lack of coöperation among the colonies. It was harder for the pioneers to build a good intercolonial road than for people nowadays to construct an international route. The leveling of hills, the draining of swamps, and the building of bridges seemed impossible tasks until the very close of the eighteenth

century. Travel in carriages was a luxury until the beginning of the nineteenth century. Private individuals and firms lacked the initiative to undertake frontier road making. The states voted that money obtained from land sales and lotteries be spent in building roads between outlying settlements. The National government also undertook to aid the improvement of transportation by building the Cumberland Road from Fort Cumberland on the Potomac to Wheeling, West Virginia. Later the road was extended through Ohio and Indiana to Vandalia, Illinois.

Travel by stage coach.

DOMINION
Vancouver
Victoria
C. Flattery
Everett
Puget Sound
Seattle
Spokane
Olympia
Tacoma
Portland
Salem
Cobur d'Alene
Great Falls
Missoula
Helena
Butte
Missouri R.
Yellowstone R.
Grand Forks
Bismarck
Aberdeen
Pierre
Sioux Falls
Lead
Sheridan
YELLOWSTONE NAT. PARK
Boise
Pocatello
Ogden
Salt Lake
Salt Lake City
Granger
Cheyenne
Denver
Colorado Sprs.
Pueblo
Trinidad
Hutchinson
Arkansas
Council
Omaha
Lincoln
Platte
Carson City
Sacramento
Stockton
San Francisco
Oakland
San Jose
Goldfield
Fresno
Los Angeles
San Diego
Ash Fork
Phoenix
Tucson
Santa Fe
Albuquerque
Tucumcari
Amarillo
Texico
Roswell
Juarez
El Paso
Oklahoma
Canadian
Red
Brazos
Denison
Ft. Worth
Waco
Austin
San Antonio
Rio Grande
Chihuahua
Guaymas
Nuevo Laredo
Laredo
Brownsv
Matamoros
Topolobampo
Torreon
Monterey
Mazatlan
TROPIC OF CANCER
Colorado
Grand Canyon
Sacramento
Snake R.
Yellowstone
Missouri
Platte
Arkansas
Rio Grande
Pecos
Brazos
Red
Canadian
Colorado
Rio Grande
Sacramento
Lower California
Gulf of California
Pacific Ocean
Mexico
To Panama
Railroads
Steamship Lines
Navigable Rivers
Canals
L.L. POATES CO., N.Y.
50°
40°
30°
120°
110°
100°
Longitude

TRANSPORTATION MAP
OF THE
UNITED STATES
SCALE OF MILES
0 100 200 300 400 500
90°
80°
70°
40°
30°
from 90° Greenwich 80°
CANADA
Port Arthur
Superior
Sudbury
Ottawa
Montreal
Quebec
Toronto
Buffalo
Rochester
Syracuse
Albany
Hartford
Boston
Providence
New York
Newark
Philadelphia
Wilmington
Dover
Baltimore
Pittsburgh
Harrisburg
Scranton
Reading
Cleveland
Toledo
Detroit
Chicago
Milwaukee
Racine
Sagina
Grand Rapids
Lansing
Oshkosh
Minneapolis
St. Paul
Winona
Madison
Dubuque
Davenport
Rock Island
Peoria
Springfield
Hannibal
St. Louis
Jefferson City
Springfield
Cairo
Nashville
Jackson
Memphis
Knoxville
Chattanooga
Atlanta
Birmingham
Macon
Augusta
Savannah
Charleston
Columbia
Wilmington
Raleigh
Charlotte
Lynchburg
Richmond
Norfolk
Wheeling
Columbus
Cincinnati
Indianapolis
Terre Haute
Evansville
Louisville
Lexington
Frankfort
Huntington
Charleston
Parkersburg
Roanoke
Knoxville
Ashevillo
Spartanburg
Savannah
Jacksonville
Tallahassee
Pensacola
Mobile
Meridian
Montgomery
Vicksburg
Jackson
Baton Rouge
New Orleans
Texarkana
Shreveport
Lake Charles
Galveston
Tampa
Miami
Key West
Havana
Nassau
Florida Strait
C. Sable
C. Hatteras
BAHAMA ISLANDS
CUBA
ATLANTIC OCEAN
To Panama
GULF OF MEXICO
Albany R.
Ottawa R.
Lawrence R.
Niagara Falls
L. ONTARIO
LAKE ERIE
LAKE HURON
LAKE SUPERIOR
LAKE MICHIGAN
Lake of Woods
Port Arthur
Superior
Sudbury
Toronto
Buffalo
Rochester
Syracuse
Albany
Hartford
Boston
Providence
Concord
Manchester
Portland
Lewiston
Augusta
Bangor
Montpelier
Burlington
Rutland
Cleveland
Toledo
Detroit
Chicago
Milwaukee
Racine
Sagina
Grand Rapids
Lansing
Oshkosh
Minneapolis
St. Paul
Winona
Dubuque
Davenport
Rock Island
Peoria
Springfield
Hannibal
St. Louis
Jefferson City
Cairo
Nashville
Jackson
Memphis
Knoxville
Chattanooga
Atlanta
Birmingham
Macon
Augusta
Savannah
Charleston
Columbia
Wilmington
Raleigh
Charlotte
Lynchburg
Richmond
Norfolk
Wheeling
Columbus
Cincinnati
Indianapolis
Terre Haute
Evansville
Louisville
Lexington
Frankfort
Huntington
Charleston
Parkersburg
Roanoke
Knoxville
Ashevillo
Spartanburg
Savannah
Jacksonville
Tallahassee
Pensacola
Mobile
Meridian
Montgomery
Vicksburg
Jackson
Baton Rouge
New Orleans
Texarkana
Shreveport
Lake Charles
Galveston
Tampa
Miami
Key West
Havana
Nassau
Florida Strait
C. Sable
C. Hatteras
BAHAMA ISLANDS
CUBA
ATLANTIC OCEAN
To Panama
GULF OF MEXICO


TRANSPORTATION MAP
OF THE
UNITED STATES
SCALE OF MILES
0 100 200 300 400 500
Railroads
Steamship Lines
Navigable Rivers
Canals
L.L. POATES CO., N.Y.
Longitude
from Greenwich
DOMINION OF CANADA
UNITED STATES OF MEXICO
GULF OF MEXICO
ATLANTIC OCEAN
PACIFIC OCEAN
CUBA
BAHAMA ISLANDS
To Panama
To Pekin
TROPIC OF CANCER

Before this road was completed to its western terminus the building of railroads had begun.

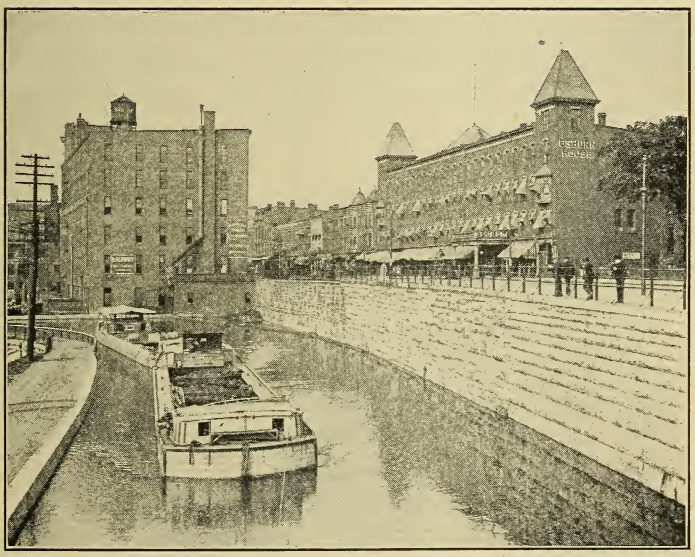
Modern American Roads. — For a long time after the introduction of railroads wagon roads were generally neglected. Recently it has been found that such roads are necessary arteries leading to the railroads. This fact and the introduction of rubber-tired vehicles and the rural free delivery mail service are causing renewed interest in good roads. To-day there are several million miles of gravel, crushed stone, or brick roads in this country. Thousands of strong bridges span the rivers in all parts of the United States.

River Transportation. — No country has been more liberally supplied by nature with rivers and lakes than the United States. The Mississippi and its large tributaries furnish 16,000 miles of navigable waterway. All told, 25,000 miles of our waterways are now serving commerce. The rivers of the United States transport a very large amount of freight at much lower rates than those charged by railroads. Grain and lumber are the chief articles of traffic on the upper Mississippi; while many vessels on the lower river start thousands of bales of cotton on their long journeys to the factories. The Ohio with its headwaters in the iron and coal region of Pittsburgh, carries to the towns on its banks many barges of coal, fleets of lumber rafts, and many steamboats filled with factory products. A single fleet of barges sometimes carries 70,000 tons of coal down the Ohio and Mississippi from Pennsylvania to New Orleans. Vast quantities of iron, grain, and petroleum also are carried by the Ohio.

Heavy ocean freight finds its way to and from Philadelphia by way of the Delaware River. The Hudson River

has a large passenger traffic, numbering several million travelers each year. It also receives vast loads of grain, meat, lumber, and other freight from the Erie Canal, which connects Lake Erie with the Hudson River. Almost every river of the Atlantic is navigable to the limit of high tide, called the Fall Line. The Pacific Coast is not so well supplied with navigable tributaries.

Canals. — Water has always been such a cheap means of transportation that in many instances if men did not find a river where they needed one, they constructed an artificial water route and called it a canal. The first important canal of America was the Erie, built from 1817 to 1825 across the state of New York from the Hudson, near Albany, to Buffalo on Lake Erie. By means of this canal, freight



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Erie Canal, Rochester, N.Y.

charges across New York from Albany to Buffalo dropped from $120 a ton to $14 a ton; from $10 for a barrel of flour to thirty cents.

The success of the Erie Canal is attested to by the impetus it gave to canal building throughout the country. In the quarter of a century following its completion, 4500 miles were completed at a cost of $214,000,000.

Improving American Waterways. — For a long time the river and canal traffic steadily increased. But as the railroads developed, river transportation steadily decreased. The waterways seemed unable to meet the railway competition and so their service became less efficient. When the cars were unable to handle the enormous crops of late years, people tried to fall back on the waterways, but found them in rather a deplorable condition, owing to neglect and to the shrinkage of water due to removal of the forests. The necessity for improving rivers and extending canals, as European nations have done long ago, became evident. Waterways associations were formed to investigate conditions and suggest improvements. Plans for improving inland navigation include the deepening of rivers, the purification of waters, development of power, the control of floods, and the extension of canals. The state of New York is now enlarging the Erie Canal so that it will carry steam-towed barges with a tonnage four times that of present canal boats.

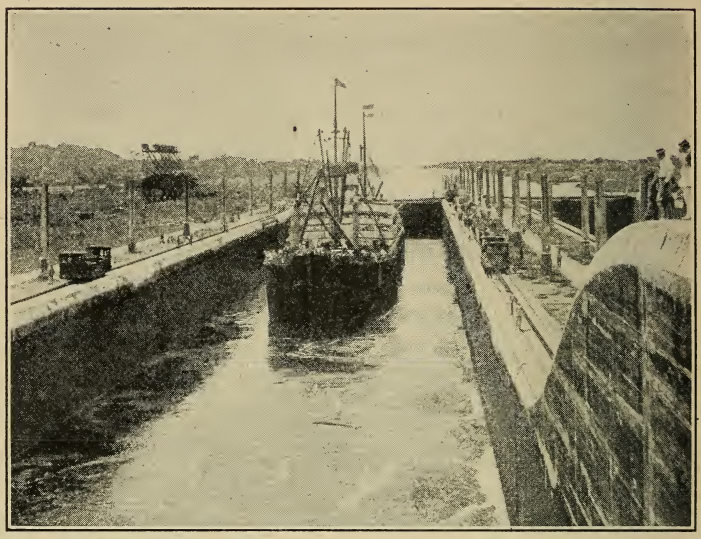
Panama Canal. — The greatest canal project of the United States is that of the Panama Canal which has just been completed. It cuts through the narrowest part of the neck of land joining North America and South America. The French started the project, but failed. The United States believed that such a canal connect-

ing the two largest oceans would be of inestimable value to the United States and also to the rest of the world. So when the French failed in their undertaking, the American government bought their plant and rights for $40,000,000. It paid the Republic of Panama $10,000,000, together with an annual payment of $250,000, for the use and control of the Canal Zone, a strip of territory ten miles wide, through which the canal was built.

Two serious problems were connected with the building of this waterway. First, the problem of sanitation; and second, the task of cutting through the mountain range which forms a part of the backbone of the two Americas. Both have yielded to the skill and energy of American engineers.

A ship entering the canal on the Atlantic side passes through a sea-level section; then it enters the Gatun Locks which lift it to Gatun Lake, which is 85 feet above sea level. This lake was formed by placing across the Chagres River a dam one and one half miles long, one half mile wide at the base, and 100 feet wide at the top. After leaving Gatun Lake, the vessel enters the Gaillard Cut, which has been excavated through the continental divide of the isthmus. The canal level in this cut is the same as that in Gatun Lake. At the Pacific end of the Gaillard Cut, the Pedro Miguel and Miraflores Locks lower the ship to another sea-level section, which leads out to the Pacific Ocean. (See map of Panama Canal Zone, p. 347.)

Great prophecies are made as to the wonderful advantages the Panama Canal will bring to America. The cheap freight rates will foster industry in all lands bordering on



A lock in the Panama Canal.

the Pacific, including our own. To meet this new business, transcontinental railroad lines are extending toward the Pacific in every North American country. There will be increased trade between Europe and our western coast.

The Canal will stimulate commerce in every city on the Mississippi, from the head of its navigable waters to the Gulf. Much traffic that now goes to the Atlantic seaboard will go to Gulf ports. Cheaper transportation between the Atlantic and Pacific coasts will increase commerce, not merely between the East and West, but between our eastern coast and Asia. All things considered, the southern coast is now much more favorably situated with reference to the commerce of the world than heretofore, hence southern ports, especially Galveston and New Orleans, should experience greater prosperity.

River Ports on the Mississippi. — The largest river port in the United States is St. Louis, in the heart of the Mississippi Valley, near the mouth of the Missouri River, where it receives and distributes large supplies of grain, meat, tobacco, and machinery. Memphis, at the head of navigation for the largest vessels on the Mississippi, is an important southern center for lumber and cotton. New Orleans, commanding the southern gateway of the continent, is the metropolis of the far South. Lying in the midst of the sugar-cane fields, it has a large sugar-refining business. It is also an important cotton-shipping point.

River Ports on the Ohio. — Pittsburgh, at the head of the Ohio, is the greatest center of the iron and steel industry in the world. It lies in the heart of the richest coal field in the world; while the Great Lakes and short rail routes from Lake Erie deliver the Superior iron at her doors. This

Pittsburgh, near the junction of the Allegheny and Monongahela rivers.

city is also famous for the production of oil and glass. Just at the point where the Ohio makes its big turn toward the southwest is Cincinnati. This city catches much of the traffic of the Ohio River. Meat, clothing, machinery, and malt liquors are its chief manufactured products.

Levee on the Ohio at Cincinnati.

The next great manufacturing and commercial center on the Ohio River is Louisville, leading in tobacco, flour, leather, and liquor industries.

Missouri River Ports. — The enormous grain and stock-raising industries of the prairie states have given rise to two of the largest meat-packing centers in the world. They are Omaha, Nebraska, and Kansas City, Kansas, both on the Missouri River.

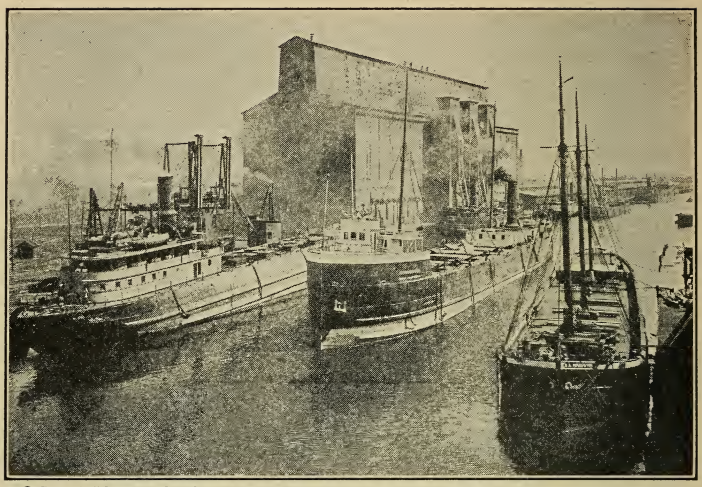
Commerce on the Great Lakes. — The Great Lakes are the greatest of all inland waterways. For commercial purposes, two canals — one on the Canadian and the other on

the American side — have been built around the rapids in the St. Marys River, between Lakes Superior and Huron. The American canal surpasses all other canals in the world in the amount of freight carried. Commerce has conquered Niagara Falls by passing through the Welland Canal, which connects Lakes Erie and Ontario. The St. Lawrence River, navigable for ocean vessels up to Montreal, connects the Great Lakes with the Atlantic.

Iron ore, grain, flour, copper, lumber, and coal supply most of the traffic carried on the Great Lakes. The first five articles, which are the chief products of the region lying near Lakes Superior and Michigan, go east; while coal, after a short haul from the mines to Lake Erie, travels west. The traffic going east is several times as large as that going west. The freight rate on the Great Lakes is scarcely one tenth that of railroads for equal distances. This accounts for the enormous lake traffic.

Lake Ports. — Many important cities are situated on the lakes, because these waters, besides affording excellent transportation facilities, are in the midst of vast mineral, lumber, and agricultural resources. From Duluth, Two Harbors, and Superior iron ore is shipped to southern and eastern lake ports. Chicago, Milwaukee, Detroit, Toledo, Cleveland, and Buffalo receive and distribute this mineral and other products carried by the lakes. Chicago, the great metropolis of the North Central section, and the greatest lake port in the world, is the second city of the United States in population.

Milwaukee, a great grain and lumber port, is noted for its flour mills, machine shops, iron works, and breweries. Detroit manufactures iron and steel cars, automobiles, and machinery. Cleveland has large meat-packing, steel, and



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Lake steamers at Buffalo.

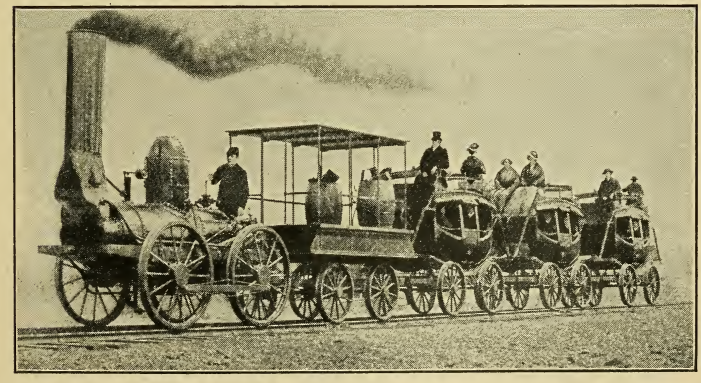
shipbuilding interests. Buffalo, at the junction of the Erie Canal and Lake Erie, takes care of an immense amount of trade between the interior of our country and the port of New York. The electric power furnished by Niagara helps to make it a very large manufacturing center.

Coastwise Trade. — The United States has the greatest coastwise traffic in the world. The large Atlantic and Gulf seaports, such as New York City, Boston, Philadelphia, New Orleans, and Galveston, are connected with one another by steamship lines. The same is true of our Pacific ports.

In 1817 a law was passed requiring all vessels employed in the coastwise trade of the United States or on the rivers or the Great Lakes to sail under the American flag. The law also requires all trade between the United States and its possessions, with the exception of the Philippines, to be carried in our own vessels.

Merchant Marine. — Our country ranks second in the world, that is, next to England, in the tonnage of its merchant vessels, but most of them are engaged in domestic trade. Only about one tenth of our exports and imports are shipped in vessels owned in the United States, while nine tenths are handled by the ships of foreign nations.

The Early Days of American Railroads. — Swifter and more reliable transportation than that afforded by canals and rivers is needed for modern commerce. This is supplied by the railroads. The first cars, something like open carriages, were drawn over rails by horses. Such simple railroads were constructed about 1828. The transportation of heavy freight demanded more than horse power. Soon locomotives were imported from England, and before long Americans set to work to improve upon them. In 1831 Peter Cooper's engine, Tom Thumb, made its maiden trip of thirteen miles in one hour and gained the honors over the horse with which it raced. Each drew one car of passengers. Another remarkable engine of this early rail-



An early American train.

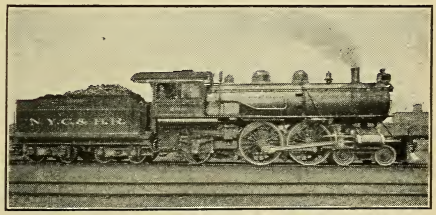
road period, the "Best Friend," made twenty miles with five loaded cars attached. The early railroads were all short, usually connecting seaports with local inland points. Then interior towns were joined. The first runs of some of the lines were great occasions. Some of the trial trips of the pioneer trains were honored with music played by a band in the first passenger coach. In order to enlist the aid of the government, state legislators were guests of honor on "first trips," which closed with festive dinners.

Main waiting room, Pennsylvania Station, New York.

By the middle of the nineteenth century hundreds of short lines under the management of as many different owners were in operation throughout the seaboard states. Passengers desiring to go great distances had to change cars frequently. Freight, too, had to be reloaded, causing unnecessary labor and delays so that goods were some-

times spoiled or lost. About 1850, a number of short lines in New York State were purchased and operated by one management. They were soon connected and afforded continuous trips between Albany and Buffalo. This was the beginning of the great system of railroads known as the New York Central Lines. Other railroad consolidations soon came into existence. The Pennsylvania Railroad is a great system built up by the union of more than 200 railroads. Soon after the middle of the century, by consolidation and westward extension of railroads, the interior came into touch with the Atlantic seaboard. By 1853 Chicago had been connected by rail with the eastern coast. With liberal aid from the National government, a railroad reached the Pacific coast in 1869. This was the first tie that firmly bound the West to the East.

Magnitude of American Railway Network. — After 1869 there was great activity in railway construction, especially in the central and western regions, which were being opened up to settlement. Since 1890 from 2000 to 5000 miles of new tracks have been built each year. Most of the unskilled labor was done by immigrants. Immense sums of money are invested in the railroads of the United States, and they do a very profitable business. The total value of United States railroads in 1910 was over $19,000,000,000, representing about a sixth of the wealth of this country, and owned by about 212,000 stockholders. More than 1,600,000 men are on the payrolls of railroad



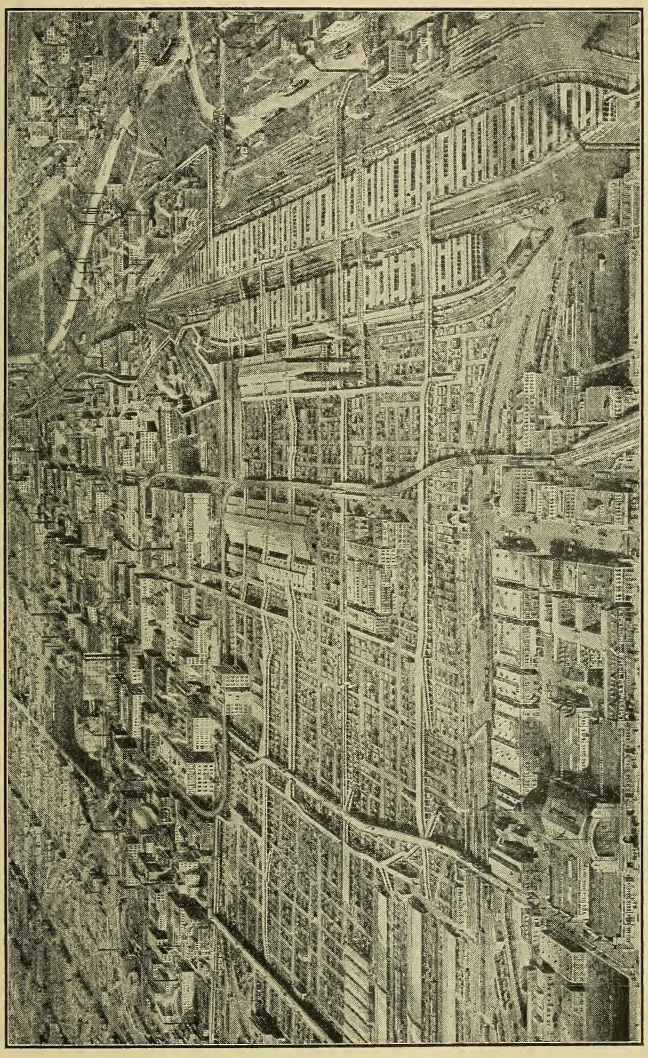
A modern American locomotive.

companies. In spite of the fact that the United States has over 250,000 miles of railway, which is 10 per cent more mileage than all Europe, and is equal to 40 per cent of all the railroads of the world, we need many more.

Importance of Railroads. — The United States could never have competed in industry and commerce with Great Britain and Germany but for the railroads. Distances here are enormous compared with those countries. All the English factories, for instance, are within fifty miles or less of the seacoast. When we remember that each of the various industries of our country is confined mainly to a special district from which its products must be distributed over a country equal in area to the continent of Europe, we get some conception of the importance of railroads. Let us briefly review a few of the great industrial districts. Corn and wheat are produced chiefly in the North Central States; cotton, sugar cane, and rice in the South; oranges, lemons, and other semitropical fruits in California and Florida; meat in the corn belt and on the western plains; and lumber in the South and Northwest. Coal is mined in Pennsylvania and other states of the Ohio basin. Illinois is a great center for the manufacture of agricultural implements; Massachusetts, shoes and cotton goods; and Pennsylvania, iron and steel. The distribution of these products and numerous others keeps the railroads busy all summer and winter, day and night.

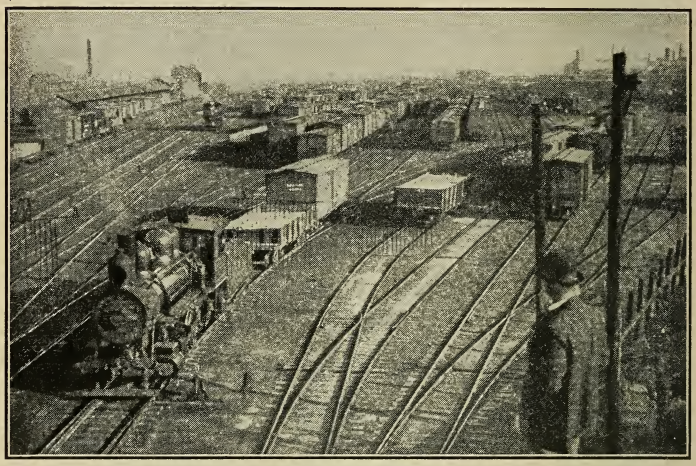
Railroad Centers. — Many river and lake ports, finding their water communication entirely inadequate, have become great railroad centers as well. Other inland cities owe their commercial importance entirely to railroads.

Chicago. — Chicago is the greatest railroad center as well as the greatest lake port in the world. Most of the



Aëroplane view of the stockyards and packing houses, Chicago.

commerce of the United States moves east and west, and Lake Michigan extending north and south for 300 miles



Railroad yards, Chicago.

causes a great concentration of railroads at its southern end. This concentration alone would make Chicago a great commercial center. It is situated in the most extensive agricultural region of the country, and the enormous productivity of this section gives a vast trade to the city. In meat packing Chicago ranks first among the cities of the world. Other important manufactures of this city are iron and steel, machinery, clothing, lumber, railroad cars, and flour.

St. Louis. — Although its favorable location for river transportation gave St. Louis an early start, its continued growth has been due to the many railroads that center there. St. Louis lies in the path of much of the commerce between the East and the West, and more than two dozen

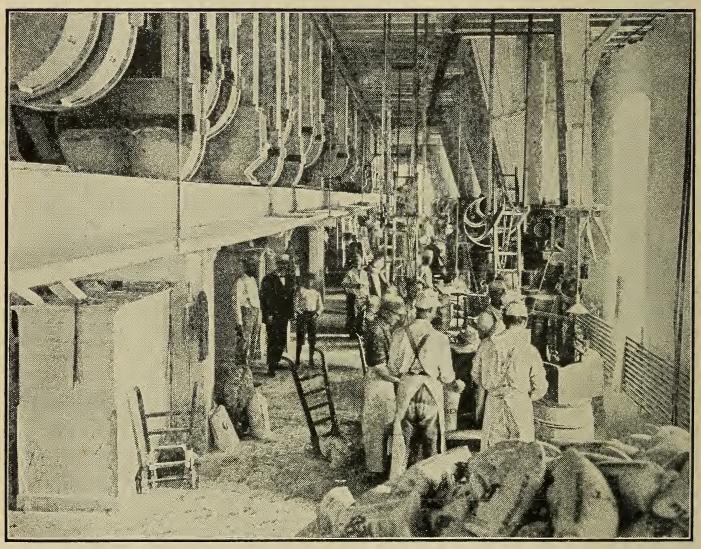
railroads enter the city. From this city several important railroads extend to the Gulf and inland cities of the South.

Railroad Centers on Lake Erie. — Buffalo, Detroit, Cleveland, and Toledo are the most important railroad centers on Lake Erie. At Buffalo, lying at the eastern end of the Lake, the east bound lake traffic is transferred from ships to railroad cars. This city is also the meeting point of railroads from the Atlantic coast, from the North Central section, and from Canada. Detroit is the crossing place of east and west railroads that run north of Lake Erie. Cleveland is the meeting point of iron ore from the Lake Superior mines and of coal from the mines of Pennsylvania, West Virginia, and Ohio. From this city the coal is shipped by water to western points. A large part of the iron ore is shipped from this point by rail to

A view of St. Louis.

the iron and steel cities south of Lake Erie. A considerable portion goes to the blast furnaces of Cleveland itself. Toledo, at the western end of Lake Erie, is an important shipping point of grain, lumber, and coal.

St. Paul — Minneapolis. — St. Paul and Minneapolis constitute a great railroad center of the Northwest. From



Interior of a flour mill, Minneapolis.

this industrial district three of the great "transcontinental" railroads run to the Pacific coast. Situated close to the pine forests near Lake Superior, and the rich wheat fields of the Red River Valley, these two cities are important shipping points of wheat, flour, and lumber. Minneapolis has the largest flour mills in the world.

Kansas City and Omaha. — Kansas City and Omaha are the chief commercial centers of the Missouri Valley. Into

these cities the railroads bring numerous trainloads of cattle and hogs to the packing houses and ship out enormous quantities of dressed meats. Kansas City in Missouri and Kansas City, Kansas, constitute a single commercial center.

Denver and Salt Lake City. — Denver lies at the meeting point of radiating mountain passes, connected by many railroads. This fact has developed its manufactures of mining machinery, and made it a financial center of the

A view of Denver.

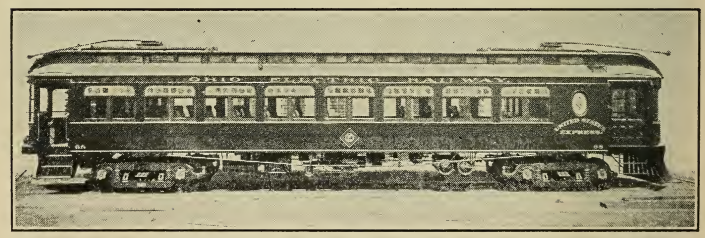
Rocky Mountain region. Salt Lake City is the chief railroad center of the Great Basin.

Indianapolis. — Most of the east and west trade of the United States moves across the level plains lying between the Great Lakes and the Ohio River. The importance of Indianapolis as a railroad center is very largely due to its location in the middle of this region. Its grain elevators, flour mills, meat-packing establishments, and automobile factories owe their success to the crossing of lines of trade and travel from all directions.

Cincinnati. — Cincinnati, the most important railroad center of the Ohio Valley, is the crossing place of several east-west lines and north-south lines. Fine railroad bridges span the Ohio at this place.

Inland Railroad Centers of the South. — Atlanta is the chief inland railroad center of the South. Birmingham and Montgomery are important transportation centers of Alabama. The former, lying in the great coal and iron district of the South, ships large quantities of pig iron. Fort Worth and Dallas, situated in the heart of a productive cattle and cotton region, are important collecting and distributing centers of northern Texas. El Paso is the center of a number of lines that connect with Mexican railways.

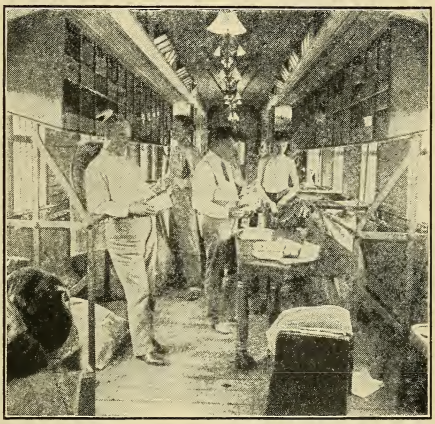
Electric Roads. — In recent years many electric railways have been built. These lines have penetrated out-of-the-way places and developed sections which the steam cars



Car used on interurban electric railway.

had failed to reach. Interurban lines have done much to promote the social life of rural districts and to relieve crowded conditions in large cities. Because they afford quick, cheap transportation, they have become carriers of milk, butter, and garden produce from country districts to the cities.

The United States Postal System. — With the introduction of the railroad, which greatly reduced the cost of mail delivery, the United States Post Office became an important promoter of trade. People write letters, ordering goods from distant parts, and they send checks and postal money orders in payment of purchases made. The cost of the postage is only a trifle in comparison with the millions of dollars involved in such transactions every day. By parcel post, packages of merchandise not exceeding fifty pounds may be mailed to all places in the first and second zones, and not exceeding twenty pounds to points in the other zones of the United States. This new work of the post office department is of great commercial importance.



Interior postal railroad car.

Telegraphs. — For modern commercial purposes, a letter is frequently too slow to produce the desired result. Since 1844 many telegraph wires have been stretched over this land to promote business by increasing communication facilities. As in the use of electricity for manufacturing, it was found that during the hours of the night the wires were not in great demand. Recently, companies have made it possible to send night letters by telegraph at greatly reduced cost. The telegraph is very necessary for the safe

operation of railroads. Hence, the poles and wires are usually placed alongside of the tracks.

Telephones. — In 1876, even a more wonderful means of communication came into use. The telephone outdoes the telegraph, for it clearly transmits the human voice hundreds and even thousands of miles. By means of this remarkable invention, goods are bought and sold in a small fraction of the time required by mail or even the telegraph. People can be in close touch with their friends or customers at a moment's notice. The farmer feels near to distant neighbors, and increases his profits by telephone communication with various markets, enabling him to buy and sell to the best advantage.

Summary of Domestic Trade. — In railroad mileage, the United States stands first among all countries. Our industrial prosperity is very largely due to the cheap and rapid transportation of goods by the railroads. Without them the great products of farms, mines, and factories could not be distributed to the sections that need them. In addition to the vast network of railroads, this country has many navigable rivers and lakes. The Great Lakes form the greatest inland waterway in the world. Good roads are of no less value than railroads, and the states are rapidly building new highways and improving old ones.

Questions and Exercises

1. Draw a map of the United States showing the coast indentations and the large rivers.

2. Collect pictures of passenger, freight, and interurban cars. Pictures of canals.

3. Trace routes through Panama Canal (*a*) from New York to San Diego; (*b*) Portland, Oregon, to New Orleans; (*c*) Boston to San Francisco.

4. In the improvements of what waterways are you most interested? How will their improvement affect the industries of your community?

5. Tell about the important river ports of your part of the country.

6. Trace the coastwise route from Boston to Philadelphia; from Philadelphia to Porto Rico; state cargoes, freight rates, and length of trip.

7. Make a railroad map of the United States, showing trunk lines.

8. On a map, connect your city by the proper railroads with the six largest cities of the United States.

9. Study a railroad map of your state.

10. Compare cost of sending a day telegram from your town to the nearest large city with that of a night telegraph letter between the same points.

11. Discuss your city streets or county roads as arteries of traffic.

12. Name the chief railroads that pass through your city. Name the most important kind of freight carried.

13. What route would you take to go to New York? Denver? St. Louis? Chicago? Seattle? New Orleans?

14. How do the Great Lakes promote commerce?

15. What do you know about the Good Roads Movement?

16. Do you know of any recent inventions that may still further revolutionize transmission of messages or mail?

CHAPTER XXII[1]

THE FOREIGN COMMERCE OF THE UNITED STATES

Our Foreign Commerce. — During the past twenty-five years, the United States has made such great progress in foreign trade that it now ranks as one of the three greatest commercial nations of the world. The value of our exports is greater than that of our imports, while the value of the exports of the United Kingdom and Germany is less than the value of the imports of each country. In the early history of the United States, farm products and other raw materials formed nearly all of our exports. To-day, manufacturing is so extensive that factory products constitute a large part. Due to our rapid gain in population, there is so great a domestic demand for foodstuffs that the export of these products is relatively decreasing. In proportion to the population, our foreign commerce is less than that of European nations. The per capita foreign trade of Great Britain is one hundred ten dollars; that of Germany is sixty-seven dollars; while that of the United States is only thirty-eight dollars. Even Switzerland and Belgium excel us in per capita foreign trade; and the Dutch average three hundred eighty dollars of foreign commerce to every man, woman, and child in the land.[1]

Exports of the United States. — The great fish and lumber resources of the northeastern section, the tobacco of the Middle Atlantic States, the cotton of the South, and grain

[1] This chapter represents conditions as they were before the Great War; for the permanent effects of the war cannot yet be ascertained.

and meat of the interior have from the start been our chief exports. To these, coal and its by-products, petroleum, iron, steel, and copper manufactures, dairy products, hops, agricultural implements, naval stores, fertilizers, carriages and cars, paper and books, furs, sugar, molasses, fruits, cotton and woolen manufactures, brass, and soap, besides many other minor products, were added later.

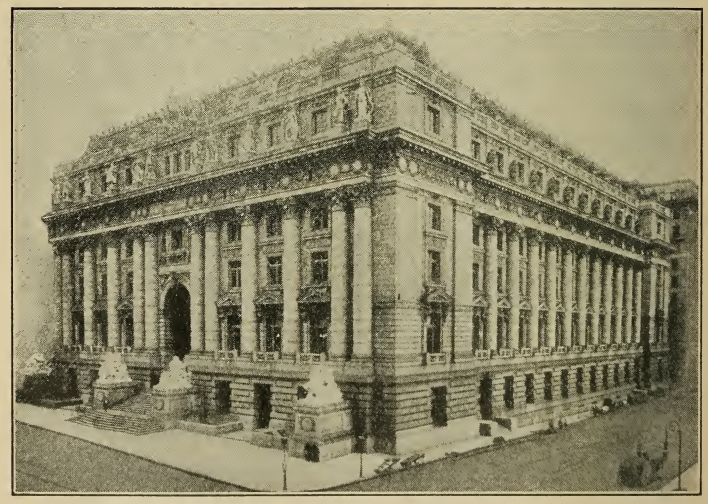
In its early stages the country sent out immense quantities of raw material, especially agricultural products. Even now these form the largest part of our exports; but they are decreasing fast. Indeed, on account of the rapidly increasing population, we may soon be compelled to import even such foodstuffs as are easily produced here. In the meantime, our manufactured goods are finding an ever better demand abroad. Now two fifths of our exports are factory products, and it is hoped that these will steadily increase in the future. At present they consist chiefly of cotton, breadstuffs, meat, and dairy products, iron and steel, leather manufactures, tobacco, coal, copper products, and fruits. Our best customers are Great Britain and Ireland, Germany, Canada, France, Netherlands, Italy, Belgium, and Mexico. These are not our only markets, for we sell at least a little to almost every nation on the earth.

Imports of the United States. — The United States imports much raw material that is converted here into finished articles; notably, raw sugar, hides and skins, raw silk, vegetable fibers, and rubber. Other imports are tropical and semitropical fruits, coffee, tea, spices, drugs, furs, toys, wool, dyes, and chemicals. Our island possessions, Porto Rico, Hawaii, and the Philippines, send us many tropical products. The countries from which we buy most are Great Britain and Ireland, Germany, France,

Cuba, Brazil, Canada, Japan, Mexico, Italy, India, Belgium, and China.

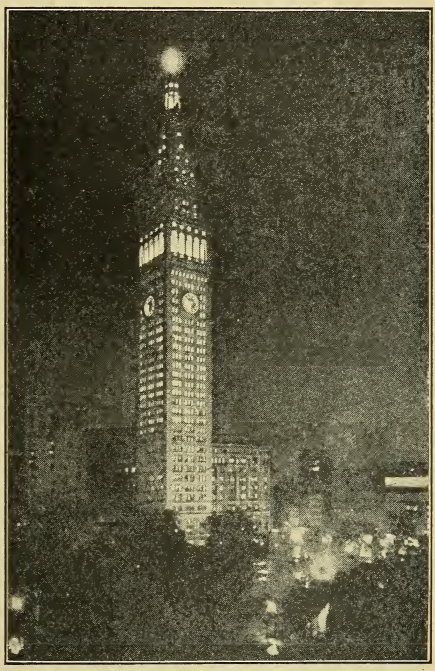
Seaports. — The United States has a greater number of large seaports than any other country. A city to become an important seaport must be situated on a good harbor, must have easy access by transportation lines to the interior of the country, and must have short water routes to the leading commercial countries of the world. Our leading seaports are New York, Boston, Philadelphia, Puget Sound, New Orleans, Baltimore, San Francisco, and Galveston. Since most of our trade is with Europe, the Atlantic ports have a far greater foreign commerce than the Pacific ports have.

Port of New York. — New York, the eastern "sea-gate of the continent," is the chief commercial port of the United States and of the world. It is the largest manufacturing



Customhouse, New York.

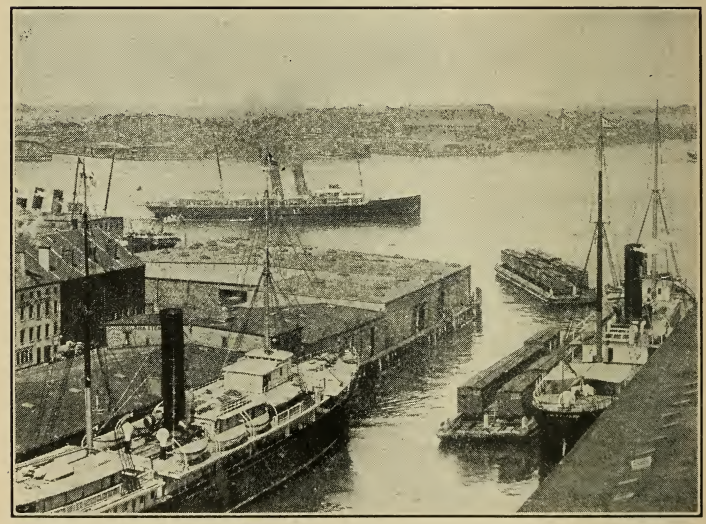
center of this country, the most important manufactures being clothing, books and periodicals, dressed meats, machinery, and refined sugar. The city is crowded with factories and warehouses; the streets are congested with land traffic, and the harbor is filled with river and ocean craft. It is America's chief banking center. Its greatest occupation is commerce. New York handles two thirds of our imports, and one third of our exports. Sixteen lines of railway, coming from the north, west, and south, center in this city. Many steamship lines terminate in New York and its adjoining ports, Hoboken and Jersey City. On an average, twenty large passenger and freight steamers arrive and depart daily. Three thousand freight cars daily bring in cargoes for these ships from the west. In order to facilitate the street traffic, the city is provided with subways through which thousands of people are carried every day between various points in the city. Tunnels under the East River connect Man-



Metropolitan Building, New York.

hattan with Brooklyn, Long Island; others under the Hudson River join the city with New Jersey.

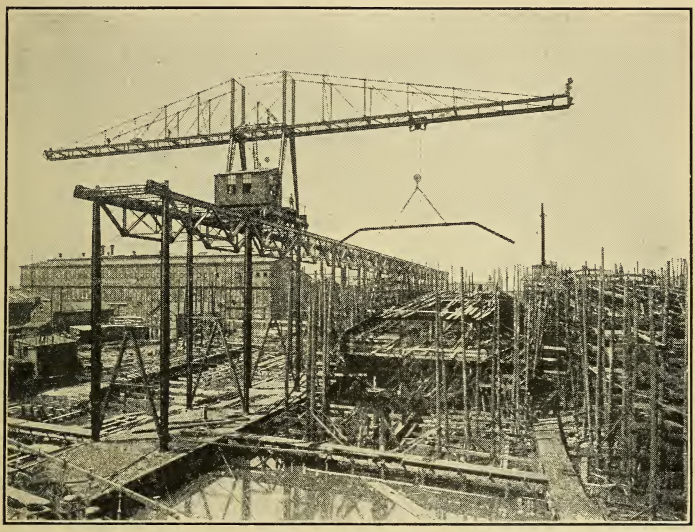
Boston, the second port of this country, has been a leading commercial center for over a hundred years. It is a large cotton, wool, and shoe market. Coal, cotton, wool, rubber, and hides are imported; corn, wheat, cattle, and leather are exported. The city has extensive trade with Great Britain, and a heavy coastwise trade with other North Atlantic cities and with Canada. It is one of the most important manufacturing centers of the United States, the chief products being books and periodicals, boots and shoes, and clothing.



Boston harbor.

Philadelphia, the fourth city in foreign commerce, is third in population. The city is an important manufactur-

ing center. Clothing, woolen goods, books and periodicals, leather, cotton goods, carpets and rugs, refined sugar, and



Shipbuilding yards, Philadelphia.

locomotives are made here. Its exports include in addition to its manufactures, corn, wheat, meat, and petroleum. The imports are chiefly fruit and raw sugar from the West Indies, and carpet wool from Europe. Steamship lines connect it with Liverpool, Antwerp, and the West Indies.

Baltimore is an important commercial and manufacturing center on Chesapeake Bay. The export trade, consisting of wheat, flour, tobacco, cotton, meat, copper, and corn, is extensive, and is carried on by three transatlantic steamship lines. The manufacturing interests include tobacco, iron and steel, and the canning of fruits and vegetables. Its most noted industry is the catching and shipping of

Unloading oysters, Baltimore.

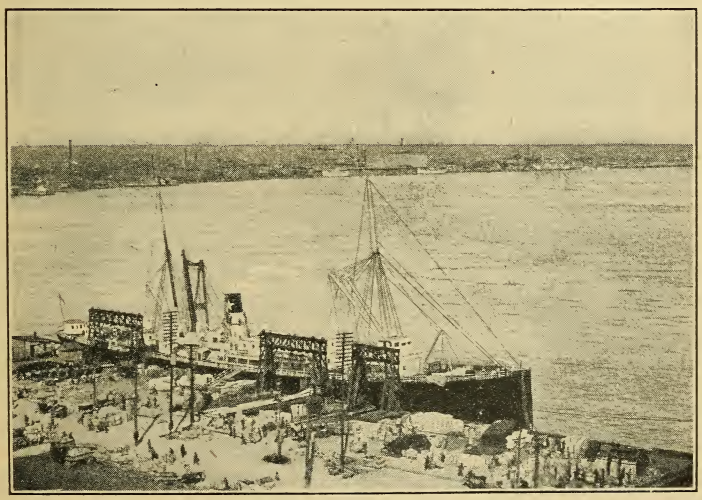
oysters. An average of thirty carloads of oysters leave daily between September and April.

Puget Sound. — Seattle, Tacoma, and other cities on Puget Sound constitute the port of Puget Sound. These cities handle most of the Alaskan trade, and also carry on extensive commerce with Asia. Lumber and wheat are leading exports of this port.

San Francisco, with one of the most beautiful harbors in the world, is the financial and commercial center of the Pacific coast. Sugar refining is an important industry, most of the raw sugar being imported from Hawaii. The Santa Fe, Southern Pacific, Union Pacific, and Western Pacific serve San Francisco, but its railway connections are only fairly good, when compared with those of the great

Atlantic ports. Steamship lines extend from San Francisco to the ports of Oregon, Puget Sound, and Alaska. Others connect it with Panama, Central America, the Hawaiian Islands, Japan, Australia, and England. Tea and silk are imported from Japan, wool is received from Australia. The principal exports, wheat, flour, lumber, canned fruits, and salmon, are sent chiefly to Europe. Los Angeles, Seattle, Tacoma, and Portland are San Francisco's commercial rivals.

New Orleans. — In foreign commerce New Orleans ranks third among the seaports of the United States, being a close rival to Boston. Although about seventy miles up the Mississippi River, the city is reached by large ocean steamers. The shallow water of the river near the mouth is deepened by the construction of walls, or jetties, which confine the river to a narrow channel. The current between the



An ocean steamer at New Orleans.

jetties has sufficient velocity to clear the channel of silt and thus keep the depth at about thirty feet. Enormous cargoes of cotton and grain are exported from this city, and large quantities of bananas and other fruits from the tropical countries to the south are brought in. The Panama Canal and larger trade with South America will doubtless increase the foreign commerce of New Orleans.

Galveston is a rival of New Orleans as a commercial center. It is one of the largest cotton-shipping ports in the world, and is a collecting and distributing center for the western part of the Gulf States.

Finding Foreign Markets. — Our tremendous gain in manufacturing industries makes it necessary to find new markets for surplus products. The countries that buy our cotton are encouraging the cultivation of cotton in their colonial possessions, and if these countries should succeed in raising much of the cotton needed for their mills, our exports would decrease unless we find other markets.

The new markets for which we are looking are not to be found in Europe where the countries are older than ours, and have turned their overflowing population from the fields into the factories. They must be found in undeveloped countries where farming is the chief occupation. In uncivilized and backward nations the people are rapidly acquiring modern methods of living and their wants are rapidly increasing. In such countries we should secure our share of commerce.

The chief reason we are not capturing foreign trade as fast as we should, is that we have not learned how to sell goods. Foreigners, especially the Germans, can teach us some valuable lessons. They have schools of practical training for youths who expect to engage in foreign trade.

German boys are taught foreign languages so that they may be able to talk business in the language of the customer. As soon as they are old enough, German apprentices in commerce are sent to foreign lands, where they take positions as office help, sometimes even as janitors, merely to acquire the power to speak the strange language fluently, and to learn all about the peculiar commercial whims and tastes of the natives. In due time they are promoted, and, finally, they return to Germany, where they report what they have learned. They are then instructed in the factory about all processes of manufacturing articles they are to sell later. We must train young Americans in the same way. They should, by all means, learn Spanish and French, and, if possible, other languages. When we have improved our system of business education a large increase in trade will come to us as it has to others.

Present Movements for Gaining Markets. — Both the government and business men of the United States see the need of increasing our foreign markets; and earnest efforts are being made to compete successfully with other nations. Men organize themselves into local societies whose business it is to study foreign needs and the best means of advertising. These organizations are called chambers of commerce, boards of trade, or commercial clubs. Agents are sent by the United States Department of Commerce into other countries for the purpose of studying trade conditions. Our national government sends consuls into all foreign lands, whose most important duty it is to study commercial needs abroad and report them to Washington at once. Formerly these reports were published monthly, but now they are published daily. Thus the government helps commerce and manufacturing, as it aids agriculture and mining.

Questions and Exercises

1. From which sections of this country do the majority of our exports come? Account for this.

2. Trace ocean routes between our seaports and those of our foreign customers.

3. Can you think of ways of securing foreign markets not mentioned in this chapter? (See the Daily Consular and Trade Reports, Department of Commerce, Washington, D.C.)

4. Name ten countries where we might successfully secure markets for our factory goods.

5. Have we as good a chance of securing foreign markets as our rivals?

6. Why have our meats been refused at times by European countries?

7. Look through the current magazines for articles on American commerce.

8. Visit your home chamber of commerce to learn what it is doing to promote the interests of the community.

9. What makes a good seaport?

10. Is it fortunate or unfortunate that most of our foreign trade is carried in foreign ships?

11. On a map, connect our leading seaports with the world's leading ports, by the proper steamship lines.

CHAPTER XXIII

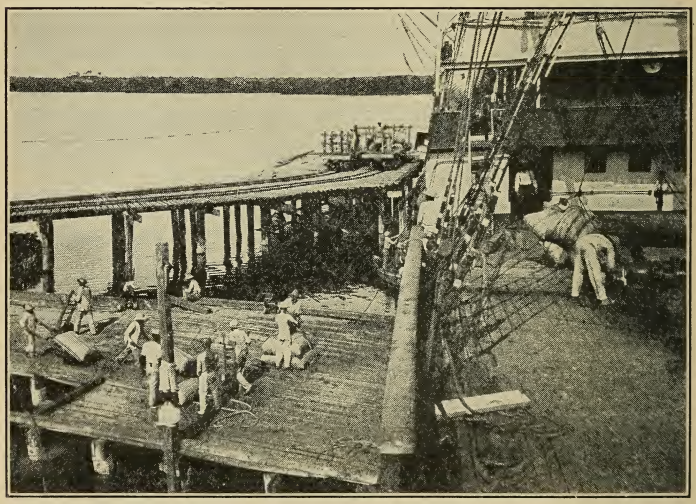
COLONIAL POSSESSIONS OF THE UNITED STATES

Outlying Possessions. — The continuous area lying between Canada and Mexico, and extending from the Atlantic to the Pacific, is known as "Continental United States," or simply the "United States." Our first outlying possession was Alaska, which was purchased from Russia in 1867. By our war with Spain, in 1898, we gained possession of Porto Rico, the Philippine Islands, and Guam; in the same year Hawaii was annexed to the United States; and in later years we acquired other islands and part of Panama. Now the Stars and Stripes float over American possessions in three zones.

Cuba and the United States. — After Spain was forced to give up Cuba at the close of the Spanish-American War,

this island, with the aid of the United States, became a republic. While Cuba is an independent nation, our country has certain rights there. The American government has agreed to protect this island against foreign attacks; in return for this service, Cuba has leased several naval stations to the United States. In this age when the ocean plays such a large part in the welfare of the nations, naval stations scattered over the waters of the earth are of great importance.

Our friendly relations with Cuba give us preference in her trade, which is fortunate, since each produces what the other wants. Our Cuban imports of sugar alone are an

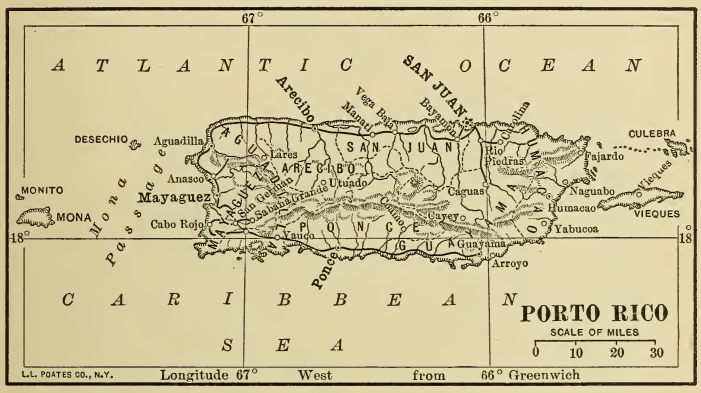


Loading sugar on a ship in a Cuban port.

item of great importance, for Cuba produces more cane sugar than any other region; and of all countries, the United States is the largest sugar consumer. In addition to sugar,

the island sends us tobacco, bananas, coconuts, oranges, pineapples, mahogany, and dyewoods; for which we return wheat, meat, lumber, and fuel. So far we have not captured her trade in manufactured imports, which she receives largely from Great Britain, Spain, Germany, and France.

Porto Rico. — Porto Rico received the Americans with open arms at the time of the revolt against Spain. Since



1898 it has had an American government, and there are friendly trade relations between it and our country. Its area is not quite that of Connecticut, but it is one of the most highly cultivated and densely populated of the West Indies. The island supports more than a million people. Life is very simple there. It is summer the year round, hence only light clothing is worn, and many houses are only grass-covered huts. Vegetables and fruits are the chief food; and their production requires little effort. Up to the time the United States took possession of it, Porto Rico had attained only the most primitive development.

American schools have been established, and modern machinery and methods of transportation are being introduced.

The United States controls almost nine tenths of the trade. We import sugar, coffee, tobacco, and fruit from Porto Rico, and export iron and steel manufactures, cotton goods, rice, flour, and meats. Its chief city, San Juan, is a

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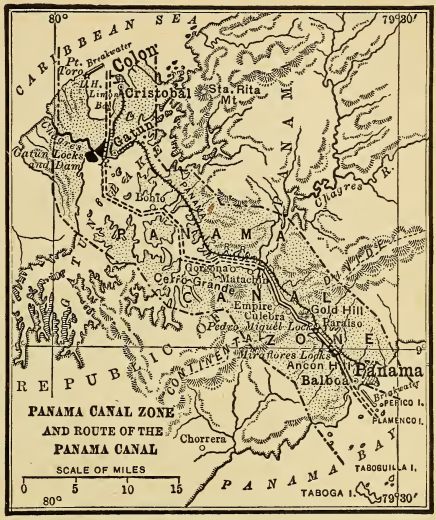
An American school in Porto Rico.

port of call for trade steamers going the rounds of the islands in the Caribbean Sea. Culebra, one of the five small adjoining islands which fell to our possession with Porto Rico, is an important naval station.

The Canal Zone. — A small strip of territory ten miles wide across the Republic of Panama, known as the Canal Zone, was acquired by the United States in 1904. The

Republic of Panama, from whom the Zone was bought, is very friendly to the United States. It, like Cuba, though independent, is under our protection against foreign attack.

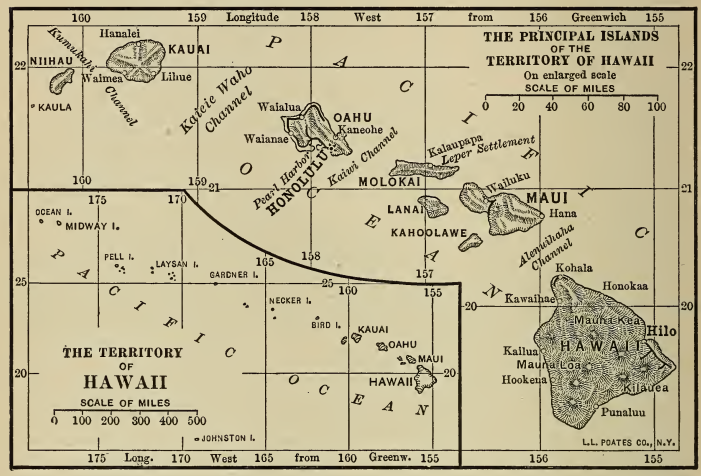


Hawaiian Islands. — One of the most beautiful possessions is the group of Hawaiian Islands, whose fertile valleys are covered with sugar and rice plantations, and whose green mountain slopes furnish pasture for cattle and sheep. The healthful climate, the invigorating breezes, and the charming landscapes make these islands almost a paradise on earth.

Oahu Island, the most populous of the group, stands at the cross-roads of commerce in the heart of the Pacific. Steamers carrying American, Asian, and Australian trade regularly stop here on their long trips across the ocean. The trade routes between San Francisco and the Philippines, between Seattle and Australia, and between Panama and Japan cross at Honolulu, which has become a coaling station for all the world. The United States could not have found better commercial and strategic possessions.

Hawaiian Products. — The warm climate and the rich volcanic soil make the raising of sugar cane the most profitable business on the island. The yield of cane per acre

is unsurpassed, because the most improved methods of cultivation are employed. Sugar forms ninety-five per cent of the total exports of the Hawaiian Islands. Most of it goes to San Francisco, the rest to New York and Philadelphia. Rice, fruit, coffee, tobacco, and hides are also exported.



The people of Hawaii realize the drawbacks of having practically only one source of income. They are trying to develop other crops, such as rice, bananas, pineapples, and coffee. Manufacturing is being developed, and the canning of pineapples and other fruits is already an important industry. The United States has most of the Hawaiian trade. In return for their sugar and fruits, we send them lumber, hardware, machinery, groceries, dry goods, and clothing.

The People of Hawaii. — The Hawaiian Islands have a very mixed population, composed of natives, Chinese, Japanese, Portuguese, and about ten thousand Americans,

British, and Germans. The business of these islands is controlled mostly by citizens of the United States, who have introduced modern improvements of every kind, — roads, railways, ships, wireless telegraph, telephones, electric light, and trolley cars. The Pacific cable connects these islands with San Francisco.

Samoa and Guam. — The United States owns a number of small islands that form important commercial stations between Hawaii and the western shores of the Pacific. Between Australia and Hawaii lie the Samoan group of islands. Five of these belong to the United States. While they have little commercial value, the natural harbor of Pago Pago makes an excellent naval station. Guam is a fertile island lying between Hawaii and the Philippines. Its chief use now is as a cable and coaling station. There are several other small islands which form parts of the American chain across the Pacific.

The Philippine Islands. — The tropical Philippines, numbering between two thousand and three thousand islands, extend over a distance north and south equal to that from Duluth to New Orleans, and east and west from Chicago to New York. Their area is almost equal to that of Great Britain and Ireland. Different parts of the group vary considerably in temperature and in the amount of rainfall.

The People. — The nine million inhabitants consist of Malays, Negritos, Chinese, Japanese, Spaniards, British, and Americans. The Malay population, about eight million in number, are called Filipinos. Most of the people are Christians, but do not have high standards of living; many are satisfied with the bare necessities of life. As a result, agriculture is not yielding a tenth of what it

PHILIPPINE ISLANDS
SCALE OF MILES
0 50 100 150 200 250
120
124
20
16
12
8
Bachi Channel
BATANES
Balintang Channel
BABUYANES
C. Bojeador
C. Engano
Laoag
Aparri
Cagayan R.
Caraballo Mts.
Tuguegarao
Vigan
Ilagan
Bagaio
Bayombong
G. of Lingayen
Lingayen
Dagupan
Tarlac
Pampanga R.
San Isidro
San Fernando
Malolos
POLILLO
Balanga
MANILA
Pasig
Cavite
Santa Cruz
Manila Bay
Laguna de Bay
Lucena
Batangas
CATANDUANES
Nueva Caceres
Mayan Vol.
Calapan
MARINDUQUE
Albay
Sorsogon
MINDORO
BURIAS
ROMBLON
San Bernardino Strait
Mindoro Strait
TABLAS
SIBUYAN
BUSUANGA
CALAMAINES
MASBATE
SAMAR
CULION
MINDORO SEA
VISAYAN SEA
Catbalogan
Caniz
PANAY
CUYOS IS.
Tacloban
LEYTE
Iloilo
GUIMARAS
Bacolod
Cebu
DUMARAN
NEGROS
DINAGAT
SIARGAO
Puerto Princesa
BOHOL
Surigao
SURIGAO SEA
Tagbilaran
Dumaguete
MINDANAO SEA
Butuan
Dapitan
Cagayan
JOLO SEA
Mts.
MINDANAO
BALABAC
Balabac Strait
Zamboanga
Cotabato
Mt. Apo
Davao
Zamboanga
Basilan Strait
CAGAYAN DE JOLO
BASILAN
PANGUTARANG IS.
Jolo
JOLO
C. San Agustin
G. of Davao
Sarangani Pt.
SARANGANI IS.
BRITISH NORTH BORNEO
TAWI TAWI
JOLO ARCHIPELAGO
SIBUTU
CELEBES SEA
SOUTH CHINA SEA
PACIFIC OCEAN
PALAWAN
L.L. POATES CO., N.Y.
Longitude 120 East from 124 Greenwich

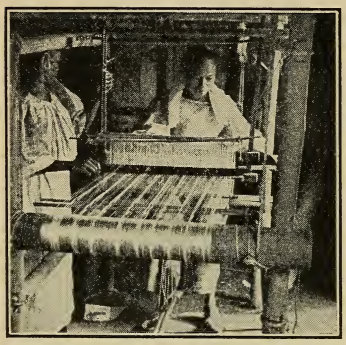
might; the most primitive methods of transportation are in use; mining and manufacturing are in their infancy.

Products. — The chief business is agriculture. The leading products are Manila hemp, coconuts, sugar, rice, fruits, and spices. As many of these are not produced in the United States, we have a very active trade with these islands. The fibers of Manila hemp are used to make ropes and binder twine. Better cultivation of the land would greatly increase the farm crops. The vast forests, containing woods adapted for cabinet work and veneering, as well as for house and ship building, are a source of great wealth. Besides timber, they yield valuable gum and dyewoods. But these resources have scarcely been touched. The mining industries have not yet been extensively developed.

Hemp factory, Philippine Islands.

Philippine Commerce. — The Philippine Islands, with twenty times as much land as there is in the Hawaiian group, and forty times as many people, carry on very little more commerce. This is due to primitive methods of cultivation, poor means of transportation, scarcity of capital, and lack of education. The leading exports are Manila hemp, copra, sugar, and tobacco. The United States receives a third of their exports, followed by the United Kingdom, France, and Spain. Their leading imports, rice, cotton goods, iron and steel products, meats, flour, and petroleum, are purchased mainly from England

and the United States. American machinery, banks, railroads, post offices, telegraphs, schools, and business methods are already greatly increasing the commercial value of these islands, and improving the conditions of the people.



A Philippine loom.

Conclusion.—The acquisition of outlying possessions has placed the United States in the class of great imperial nations, not because the possessions gained are extensive in territory, but because they are important for commercial and naval reasons. We have become the peers of the British and the German empires.

Questions and Exercises

1. How do you account for our long-time lack of interest in colonies while England and Germany were strenuously striving for more territory?

2. Is it easy or difficult for colonies, like the Philippines, to suddenly adjust themselves to a new government?

3. Could we have commercial prosperity in our colonies without establishing a strong modern government there?

4. In a general way compare the climate and products of the United States with those of her colonies.

5. Which of our colonial possessions do you consider the most valuable? Why?

6. Of what political and commercial advantage to the United States is the American Pacific cable which connects her islands with the mainland?

CHAPTER XXIV

THE MATERIAL, SOCIAL, AND POLITICAL STATUS OF THE UNITED STATES TO-DAY

Material Resources. — The United States, stretching from ocean to ocean and from the Gulf to the Great Lakes, is a storehouse of rich treasures. Extensive areas of fertile farm lands, rich mines, extensive forests of valuable timber, navigable lakes and rivers, and swift streams furnishing enormous water power are some of our greatest natural resources. Our country produces more coal and iron than any other country. Larger crops of corn and cotton are grown in the United States than in all the rest of the world; and our wheat crop is larger than that of any other country. In the manufacture of iron and steel goods, flour, meats, and many other important products we excel all other countries.

Conservation of Natural Resources. — So vast were our natural resources that for a long time we were extravagant in the use of them. At last we realized the danger of wastefulness, and we are now beginning to conserve the material wealth of our country. We are guarding our forests against fires that in past years have caused such appalling losses. Unnecessary waste in lumbering and in the manufacture of wood products is growing less each year. By more careful methods of mining we are securing a larger percentage of the available mineral supply than ever before. Through scientific methods of agriculture we are obtaining larger crops than heretofore, and at the same time we keep the soil up to its full measure of fertility.

People. — It required the brain and brawn, not merely of one but of many nationalities, to develop the wonderful resources of the United States. Fundamentally, America is English; but descendants of Germany, Sweden, Holland, France, and Spain worked at this gigantic task from the very start. In later years, Italians, Russians, and Austrians sought and found homes in America and are adding their share of effort to the building up of this great nation. Moreover the negro, the red man, and the Mongolian have each played a part in making America the most cosmopolitan of nations.

Characteristics of the Americans. — The inherent characteristics of Americans, which are the most important factor in their success, are self-reliance, push, audacity, inventiveness, fair-mindedness, eagerness for novelty, a world-wandering spirit, a capacity for work, and a love of duty.

Conservation of Human Beings. — Great attention is being given to the conservation of the health of our people. New methods of fighting disease are being discovered each year, and great emphasis is placed upon the maintenance of the conditions that insure public health. To promote public health, laws have been passed making sanitary conditions compulsory. Crowded tenements are being abolished. Cities are cleaning streets and alleys, quarantining contagious diseases, and inspecting food supplies. The hours of labor have been reduced from sixteen and eighteen to ten and eight. Children are not permitted to work at all in certain occupations. Laws are enforced to prevent accidents in mines, factories, and on railroad trains.

Government by the People. — Our laws are made by Congress, which consists of the Senate and the House of

Representatives. The members of both houses of Congress are elected by the people. The term of office of Senators is six years, that of Representatives is two years. The chief executive of the United States is the President, elected for four years. He may advise Congress on governmental affairs, but is unable to make a law. In many respects he is subject to other departments of the government. All American officials are responsible to the people. Our liberal government gives the citizens wonderful privileges, but it also lays great duties on us. We must all help to work out the national welfare. Republics are safe only when all the people realize their responsibilities and strive after high standards of living.

Education in the United States. — The public schools in our country are supported generously by taxation, and

A class in cooking.

parents and guardians are compelled by law to send their children to school for a specified number of years. The more progressive states are now raising the age limit at which pupils may stop school from fourteen years to sixteen. More subjects are constantly added to the curriculum, such as hygiene and industrial training. More money

A class in woodworking.

is being spent on elementary schools, high schools, agricultural colleges, universities, trade and professional schools. Plans are being made for every kind of commercial training. This nation gives so much attention to the education of the youth because the people believe that it is the chief means of assuring their future welfare.

Means of Recreation. — We give considerable attention to recreation and pleasure. Good plays, operas, and concerts are offered to the public in winter; and outdoor musical entertainments are furnished in summer. Newspapers

and magazines devoted to every possible interest may be had at small cost. Most of the American homes have lawns of their own, and there are many public parks and playgrounds in the large cities. The rivers and lakes afford boating and swimming. Working hours are short-

School children dancing in public recreation grounds.

ened in summer. The Saturday half holiday and the annual two weeks' vacation, usually with pay, are important factors in making efficient American citizens. No other country offers more magnificent recreation centers than ours. There are the many famous Atlantic summer resorts, the lakes of Maine, the White Mountains of New Hampshire, the Green Mountains and Lake Champlain of Vermont, the Adirondacks and Niagara Falls of New York, the winter resorts of Florida, the summer resorts of northern Michigan, the wonderful caves of Indiana and Ken-

tucky, the Great Lakes of the North, and the glorious mountains of the West.

Good Will of Other Countries. — The United States is on friendly terms, not only with other countries of North America, but also with nearly all the other nations of the world. By carefully observing the rules of neutrality when other countries are at war, by giving disinterested advice when they reach a crisis, by furthering the cause of peace in other lands, and by carefully respecting the rights of others, our country has gained for herself a lofty position in the good will and respect of the world.

Our Relations with England and Germany. — The year 1914 marked the hundredth anniversary of peace between England and the United States. The bonds of friendship are becoming stronger every year. Until 1917 we never had a war with Germany. We joined the Allies then in order to make the world safe for democracy. The inhabitants of England, Germany, and our own country have many common traits; such as, their earnest application to industry; their world-wandering spirit; and their intense desire for conquest, which in late years has come very often to mean victory over material things through brain power. It is this last quality, namely, that of intelligence, joined with an unyielding determination to master the big problems of industry, that has made England, Germany, and the United States the Three Industrial Nations.

Table I. — Area and Population, the United States

State	Area Sq. Mi.	Pop. 1910
Alabama	51,998	2,138,093
Arizona	113,956	204,354
Arkansas	53,335	1,574,449
California	158,297	2,377,549
Colorado	103,948	799,024
Connecticut	4,965	1,114,756
Delaware	2,370	202,322
Florida	58,666	752,619
Georgia	59,265	2,609,121
Idaho	84,313	325,594
Illinois	56,665	5,638,591
Indiana	36,354	2,700,876
Iowa	56,147	2,224,771
Kansas	82,158	1,690,949
Kentucky	40,598	2,289,905
Louisiana	48,506	1,656,388
Maine	33,040	742,371
Maryland	12,327	1,295,346
Massachusetts	8,266	3,366,416
Michigan	57,980	2,810,173
Minnesota	84,682	2,075,708
Mississippi	46,865	1,797,114
Missouri	69,420	3,293,335
Montana	146,572	376,053
Nebraska	77,520	1,192,214
Nevada	110,690	81,875
New Hampshire	9,341	430,572
New Jersey	8,224	2,537,167
New Mexico	122,634	327,301
New York	49,204	9,113,614
North Carolina	52,426	2,206,287
North Dakota	70,837	577,056
Ohio	41,040	4,767,121
Oklahoma	70,057	1,657,155
Oregon	96,699	672,765
Pennsylvania	45,126	7,665,111
Rhode Island	1,248	542,610
South Carolina	30,989	1,515,400
South Dakota	77,615	583,888
Tennessee	42,022	2,184,789
Texas	265,896	3,896,542
Utah	84,990	373,351
Vermont	9,564	355,956
Virginia	42,627	2,061,612
Washington	69,127	1,141,990
West Virginia	24,170	1,221,119
Wisconsin	56,066	2,333,860
Wyoming	97,914	145,965
Part of Gt. Lakes	61,750	
Territories, Etc.		
District of Columbia	70	331,069
Territory of Alaska	590,884	64,356
Guam	210	9,000
Territory of Hawaii	6,449	191,909
Philippine Islands ('03)	115,026	7,635,426
Porto Rico	3,435	1,118,012
Panama Canal Zone	474	50,000
Samoa Is., etc.	77	6,100
Soldiers and Sailors abroad		55,608
Grand Total	3,805,074	101,102,677

Largest Cities of the United States

	Population, 1910		Population, 1910
New York, N. Y.	4,766,883	Oakland, Cal.	150,174
Chicago, Ill.	2,185,283	Worcester, Mass.	145,986
Philadelphia, Pa.	1,549,008	Syracuse, N. Y.	137,249
St. Louis, Mo.	687,029	New Haven, Conn.	133,605
Boston, Mass.	670,585	Birmingham, Ala.	132,685
Cleveland, Ohio	560,663	Memphis, Tenn.	131,105
Baltimore, Md.	558,485	Scranton, Pa.	129,867
Pittsburgh, Pa.	533,905	Richmond, Va.	127,628
Detroit, Mich.	465,766	Paterson, N. J.	125,600
Buffalo, N. Y.	423,715	Omaha, Neb.	124,096
San Francisco, Cal.	416,912	Fall River, Mass.	119,295
Milwaukee, Wis.	373,857	Dayton, Ohio	116,577
Cincinnati, Ohio	363,591	Grand Rapids, Mich.	112,571
Newark, N. J.	347,469	Nashville, Tenn.	110,364
New Orleans, La.	339,075	Lowell, Mass.	106,294
Washington, D. C.	331,069	Cambridge, Mass.	104,839
Los Angeles, Cal.	319,198	Spokane, Wash.	104,402
Minneapolis, Minn.	301,408	Bridgeport, Conn.	102,054
Jersey City, N. J.	267,779	Albany, N. Y.	100,253
Kansas City, Mo.	248,381	Hartford, Conn.	98,915
Seattle, Wash.	237,194	Trenton, N. J.	96,815
Indianapolis, Ind.	233,650	New Bedford, Mass.	96,652
Providence, R. I.	224,326	San Antonio, Tex.	96,614
Louisville, Ky.	223,928	Reading, Pa.	96,071
Rochester, N. Y.	218,149	Camden, N. J.	94,538
St. Paul, Minn.	214,744	Salt Lake City, Utah	92,777
Denver, Col.	213,381	Dallas, Tex.	92,104
Portland, Ore.	207,214	Lynn, Mass.	89,336
Columbus, Ohio	181,511	Springfield, Mass.	88,926
Toledo, Ohio	168,497	Wilmington, Del.	87,411
Atlanta, Ga.	154,839	Des Moines, Iowa	86,368

TABLE II. — LEADING EXPORTS OF UNITED STATES, VALUE, PRINCIPAL COUNTRIES OF DESTINATION. FOR THE YEAR ENDING JUNE, 1914.

	THOUSANDS OF DOLLARS
Cotton, unmanufactured	610,475
United Kingdom	231,818
Germany	181,892
France	73,919
Cotton, manufactures of	28,845
China	6,096
Philippine Islands	5,536
Copper, manufactures of	144,896
Germany	46,123
Netherlands	26,493
France	25,453
United Kingdom	22,443
Meats	143,262
United Kingdom	61,223
Germany	19,143
Iron and steel, manufactures of	106,560
Canada	30,130
United Kingdom	9,400
Wheat	87,953
United Kingdom	26,015
Netherlands	19,380
Belgium	12,479
Germany	10,605
France	5,385
Flour	54,454
United Kingdom	13,806
Netherlands	4,670
Cuba	4,058
Hongkong	4,502
Oil, illuminating	74,500
United Kingdom	10,007
Netherlands	8,849
China	6,349
Japan	4,757
Germany	4,290
Oil, lubricating, etc.	27,853
United Kingdom	6,469
France	3,430
Germany	3,204
Coal	59,921
Canada	47,210
Lumber	57,781
United Kingdom	13,232
Canada	10,434
Tobacco, unmanufactured	53,964
United Kingdom	20,698
Italy	6,114
France	4,783
Germany	4,014
Agricultural implements	31,966
Russia	6,496
Argentina	4,345
France	4,150
Germany	3,216
Canada	3,073
Automobiles	26,575
Canada	5,920
United Kingdom	5,853

LEADING IMPORTS OF UNITED STATES, VALUE, PRINCIPAL COUNTRIES OF ORIGIN. FOR THE YEAR ENDING JUNE, 1914.

	THOUSANDS OF DOLLARS
Coffee	110,725
Brazil	76,016
Columbia	11,556
Mexico	8,028
Venezuela	6,194
Central American countries	4,944
Sugar, cane	101,366
Cuba	98,395
Philippine Islands	2,554
Silk, raw	97,828
Japan	71,345
China	15,919
Italy	8,781
Rubber, crude	71,220
United Kingdom (reëxported)	31,152
Brazil	16,319
Cotton, manufactured and unmanufactured	70,841
United Kingdom	16,197
Egypt (raw cotton)	12,276
Germany	12,016
France	11,763
Switzerland	9,670
Copper in ore, pigs, ingots, etc.	54,322
Mexico	14,457
Canada	7,947
Peru	6,598
Chile	6,126
Spain	5,280
Wool, unmanufactured	52,619
United Kingdom	19,377
Argentina	7,563
Australia and New Zealand	6,936
Cattle	52,182
Argentina	16,166
Canada	7,133
Mexico	5,479
Jute, fabrics of	42,421
India	35,273
Tobacco	35,029
Cuba	16,385
Turkey	9,837
Art works	35,010
France	22,332
United Kingdom	7,937
Sisal hemp	25,861
Mexico	22,980

Table III. — Ocean Steamship Routes

From San Francisco to

City	Route	Miles	City	Route	Miles
Honolulu	Direct	2,091	Sitka	Direct	1,302
Hongkong	Via Honolulu	7,030	Unalaska	Direct	2,051
Yokohama	Direct	4,799	Nome	Via Unalaska	2,706
Apia	Direct	4,161	Mazatlan	Direct	1,337
Auckland	Via Apia	5,742	Acapulco	Direct	1,833
Sydney	Via Honolulu	6,511	Panama	Direct	3,245
Melbourne	Via Honolulu	7,033	Callao	Direct	3,987
Guam	Via Honolulu	5,428	Valparaiso	Direct	5,140
Manila	Via Honolulu	6,934	Punta Arenas	Direct	6,193
Singapore	Via Manila	8,304	New York	Via Magellan Strait	13,135
Port Townsend	Direct	770	New York	Via Panama Canal	5,262

From New Orleans to

City	Route	Miles	City	Route	Miles
Vera Cruz	Direct	798	Valparaiso	Via Panama Canal	3,926
Colon	Direct	1,395	Tampa	Direct	474
San Francisco	Via Magellan Strait	13,500	Havana	Direct	601
San Francisco	Via Panama Canal	4,69c	New York	Direct	1,685
Valparaiso	Via Magellan Strait	9,000	Liverpool	Direct	4,625

From New York to

City	Route	Miles	City	Route	Miles
Bermuda	Direct	681	Melbourne	Panama Canal	9,945
Liverpool	Southern	3,153	Sydney	Suez Canal	13,471
London	Southern	3,245	Sydney	Cape of Good Hope	13,306
Havre	Southern	3,274	Sydney	Panama Canal	9,691
Gibraltar	Direct	2,219	Wellington	Suez Canal	14,387
Pernambuco	Direct	3,698	Wellington	Cape of Good Hope	14,034
Rio de Janeiro	Direct	4,770	Wellington	Panama Canal	8,522
Montevideo	Direct	5,807	Yokohama	Suez Canal	13,079
Punta Arenas	Magellan Strait	7,000	Yokohama	Cape of Good Hope	15,099
Punta Arenas	Panama Canal	5,967	Yokohama	Panama Canal	9,677
Valparaiso	Magellan Strait	8,380	Bombay	Suez Canal	8,186
Valparaiso	Panama Canal	4,633	Bombay	Cape of Good Hope	11,395
San Francisco	Magellan Strait	13,135	Bombay	Panama Canal	14,982
San Francisco	Panama Canal	5,262	Calcutta	Suez Canal	9,829
Port Townsend	Magellan Strait	13,873	Calcutta	Cape of Good Hope	12,254
Port Townsend	Panama Canal	6,002	Calcutta	Panama Canal	14,165
Honolulu	Magellan Strait	13,312	Singapore	Suez Canal	10,177
Honolulu	Panama Canal	6,702	Singapore	Cape of Good Hope	12,409
Melbourne	Suez Canal	13,009	Singapore	Panama Canal	12,522
Melbourne	Cape of Good Hope	12,838			

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